The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 114, No. 15 — APRIL 13, 1940

COPYRIGHT, 1940, BY AMERICAN MEDICAL ASSOCIATION
CHICAGO, ILLINOIS

PULMONARY EMBOLISM

SUGGESTIONS FOR ITS DIAGNOSIS, PREVENTION AND MANAGEMENT

GEZA DE TAKATS, M.D.
AND
JOSEPH H. JESSER, M.D.
CHICAGO

When patients die of pulmonary embolism following operation or childbirth, a feeling of helplessness and discouragement prevails until the incident is forgotten. Many months pass before the occurrence of the next one. It is remarkable, however, that the survey of large collective statistics reveals a fairly steady incidence in large services, namely from 0.1 to 0.2 per cent of all operations, 2 per cent of all deaths, 6 per cent of postoperative deaths and about 10 per cent of all autopsies. The prevention of postoperative or postpartum thromboses and the investigation of types of patients, types of diseases and types of operations which are especially endangered by pulmonary embolism are possible avenues of approach to the problem. In this discussion, however, we wish to limit ourselves to observations on the value of early diagnosis and the employment of simple procedures which may reduce its incidence and its high mortality.

THE GROUPING OF PATIENTS HAVING PULMONARY EMBOLISM

It is customary to speak of medical and surgical cases of embolism. While the medical group chiefly consists of cardiac patients or patients suffering from malignant growths in the terminal stages, the surgical group comprises patients with a postoperative or postpartum embolism. This classification is of some practical importance, as obviously the diagnosis in the medical group will be obscured by the symptoms of heart disease; also a patient with a failing heart or in a dehydrated, demineralized, debilitated state is less responsive to therapeutic measures than one in the surgical group.

Of 100 cases of pulmonary embolism which were taken from the records of St. Luke's and the Research and Educational Hospitals of Chicago, twenty-five were medical, seventy-four were surgical and one was obstetric. The cases were accepted for study only (1) if there was a postmortem verification of the diagnosis or (2) if the course of the disease, whether fatal or not, revealed evidence of thrombophlebitis, hemoptysis or x-ray evidence of infarction and other conditions simulating embolism could be reasonably excluded. Fat emboli were not included in this series, as they represent a somewhat different problem.

From the Neurocirculatory Clinic, University of Illinois College of Medicine, and the Circulatory Group, St. Luke's Hospital.

THE DIAGNOSIS

Table 1 shows the primary diagnosis of patients who suffered pulmonary embolism in the order of their frequency. Unless these can be related to the total number of admissions during the same period, the absolute figures are not conclusive; but it is sufficiently clear that of the medical group the cardiac patients, and of the surgical group the patients subjected to pelvic laparotomy, seemed to be most frequently affected. When these cases are examined from the standpoint of immobilization and venous stagnation in the pelvis, the importance of these two factors receives renewed emphasis.

Of special interest have been the initial symptoms and signs of pulmonary embolism as recorded in the nurses' notes (table 2). These were often made by student nurses during the excitement of seeing perhaps one of their first emergencies. Nevertheless the three leading symptoms of dyspnea, chest pain and cyanosis are well brought out; the fall in blood pressure, which was not recorded except in the last few years, is suggested by the notes of weak, rapid pulse, shock and restlessness. Abdominal symptoms, which in our experience have occasionally led to diagnosis of acute cholecystitis, ruptured viscus and other conditions, are represented. Cerebral anemia is signified by convulsions or dizziness.

There are, of course, far more complete and detailed descriptions of symptoms in individual cases, but we wish to emphasize these simple and often incomplete observations to show that emergency measures, when instituted immediately after the early observations of the nursing staff, might be adopted if the time interval between first symptoms and death was not too short. To study this angle table 3 was prepared. These time intervals are rather striking, as it is a customary comment with regard to therapeutic efforts in pulmonary embolism that patients either die before anything can be done or recover anyway. In this group of seventy fatal embolisms 8.5 per cent died in less than ten minutes and roughly 60 per cent lived more than one hour, 34 per cent living from one to several days. There is certainly time to institute certain measures during this period, and their discussion will follow later.

Brief mention should be made of the value of roentgenograms, especially in the early hours or days following the embolus. Perhaps insufficient emphasis has been placed on the fact that an embolus is not equivalent to a pulmonary infarct. The obstruction of an artery in the lung will produce hemorrhagic infarcts only in case of secondary venous thrombosis.[1] If an anemic infarct occurs it can often give the picture of a localized emphysema because of the concomitant bronchial obstruction, which is usually incomplete, so that air is

1. Karsner, H. T., and Ash, J. E.: Studies in Infarction: II. Experimental Bland Infarction of the Lung, J. M. Res. 27: 205, 1912-1913.

aspirated into the alveoli but cannot be exhaled. These partial bronchostenoses have been studied roentgenologically in great detail by Westermark.[2]

PRECIPITATING FACTORS IN PRODUCING EMBOLISM

A problem frequently arises when a manifest thrombophlebitis is present or when pulmonary infarction has already occurred and another one is feared; namely,

TABLE 1.—*Type of Diseases or Operations Followed by Pulmonary Embolism in 100 Cases, 1926-1938*

A. Medical Group		B. Surgical Group	
Heart disease	18	Pelvic laparotomy	23
Phlebitis	2	Prostatectomy	8
Malignant growths	2	Cholecystectomy	5
Brain tumor	1	Herniotomy	5
Pulmonary emphysema	1	Appendectomy	5
Pyelonephritis	1	Fracture	5
	25	Malignant growths	3
		Osteomyelitis	3
C. Childbirth	1	Amputation	3
		Lobectomy	1
		Phrenico-exeresis	1
		Infected scalp	1
		Laminectomy	1
			74

the recognition of tangible factors which are responsible for the breaking loose of the clot. Again using the nurses' records as a basis, table 4 was prepared. Bowel movement and active or passive physical exertion seem to head the list of known causes. The milking action of a large enema, straining on the bedpan or getting out of bed for the first time are well known precipitating factors; reverse gastrointestinal peristalsis seems to have preceded the embolus in at least two cases; whether the one case of hiccup brought on the embolus or was the result of a lower lobe infarct, with diaphragmatic irritation, cannot be decided. In seventy of 100 cases, however, no obvious precipitating factor could be elicited; this emphasizes that, outside of purely mechanical factors, possibly physiochemical changes may be at play, which result in uneven clot retractility,[3] so that the tail of the thrombus will freely float in the venous stream and can readily break off. We have also considered the meteorologic influences on the mobilization of the clot; this study has been undertaken by Dr. William F. Petersen and one of us (G. de T.).[3a]

TABLE 2.—*Initial Symptoms and Signs of Pulmonary Embolism as Recorded in the Nurses' Records in 100 Cases*

Dyspnea	42	Weak rapid pulse	26
Pain in the chest	32	Shock	12
Cyanosis	24	Restlessness	9
Nausea and vomiting	6		
Pain in abdomen	5		
Chill	4		
Convulsion	3		
Dizziness	2		
Four patients were found dead			

The mortality under discussion was very high. Eighty-seven patients died and only thirteen recovered; eleven patients of the 100 showed a typical thrombophlebitis of one or both lower extremities; with the exception of two patients, the embolus preceded the appearance of the typical milk leg. A surprisingly high number of patients had more than one infarct (table 5). It would seem from this small series that if a patient survived one pulmonary embolus he would have a 40 per cent chance of having another one; but if he survived the second one he would have only a 12 per cent chance of having any more.

Of the eighty-seven deaths due to pulmonary embolism, for only thirty (34 per cent) are autopsies available; but one very interesting observation was made in this small series. In eight autopsies, or 27 per cent of the group, a fatal pulmonary embolism occurred with a patent main pulmonary artery, only the left or right artery or a small branch being obstructed (table 6). This feature, also emphasized by Leriche and his co-workers,[4] would suggest that other factors besides the mechanical plugging of the lesser circulation may be at play.

Bronchial obstruction in pulmonary embolism has been ignored in the past. And yet at autopsy and in the experimental animal one frequently sees blood and mucus plugging the bronchial tree. In fact the plug may so completely close the bronchus that atelectasis may result in the corresponding area. In addition there is some evidence of bronchial spasm accompanying experimental pulmonary embolism.[5] The mechanism of this phenomenon will be understood when a study of some reflexes occurring during pulmonary embolism is reviewed.

TABLE 3.—*Fatal Pulmonary Embolism in Seventy Cases*

Time Elapsed Between First Symptoms and Death	
Found dead or died immediately	3
Ten minutes or less	3
From ten minutes to one hour	16
From one to twelve hours	20
From twelve to twenty-four hours	4
From one to several days	24
Total	70
Died in less than ten minutes	8.5%
Died in less than one hour	32%

In a previous paper[6] evidence was presented that death from pulmonary embolism is not always due to asphyxia, failure of the right heart or insufficient venous return to the left heart. True enough, these conditions prevail when the main pulmonary artery or both right and left branches are simultaneously obstructed, but there are enough postmortem records to indicate that patients may die from a small embolus obstructing an insignificant area of the lung. In addition, our animal experiments have shown that dogs when given a fatal quantity of embolizing material may be saved in at least 50 per cent of the cases if they receive atropine or if their vagi are cut. We with Fenn have also presented electrocardiograms of dogs indicating strong vagal effects on the heart, which may be abolished with atropine.[7] On the basis of these animal experiments and others which deal with vagal effects on the bronchial tree and the gastrointestinal tract, we feel that a widespread radiation of autonomic reflexes occurs during pulmonary embolism, which may contribute to the causes of death (fig. 1).

As the vagus constricts the smooth muscles of the coronaries, the bronchi and the upper gastrointestinal

2. Westermark, Nils: The Roentgen Diagnosis of Pulmonary Embolism, Acta radiol. **19**: 357, 1938.

3. Lampert, Heinrich: Thrombose und Embolie, Dresden, Theodor Steinkopff, 1933.

3a. de Takats, Geza; Mayne, A., and Petersen, W. F.: The Meteorologic Factor in Pulmonary Embolism, Surgery, to be published.

4. Leriche, René; Fontaine, René, and Friedmann, Léon: L'infiltration stellaire est-elle justifiée dans l'embolie pulmonaire du point de vue physiologique? J. de chir. **50**: 737 (Dec.) 1937.

5. Singh, Inderjit: Certain Effects of Pulmonary Gas Embolism, J. Physiol. **87**: 11 (June 10) 1936. Binet, Léon, and Burstein, M.: Recherches sur la motricité des bronches, Presse méd. **47**: 217 (Feb. 11) 1939.

6. de Takats, Geza; Beck, W. C., and Fenn, G. K.: Pulmonary Embolism, Surgery **6**: 339 (Sept.) 1939.

7. de Takats, Geza, and Fenn, G. K.: Studies in Pulmonary Embolism.

tract, to atropine, which blocks the vagal impulse, the use of papaverine, a relaxer of contracted smooth muscle, was added. These animal experiments led to the proposal that, in the emergency treatment of pulmonary embolism, wide use be made of the inhibition of such reflex changes.

ATTEMPTS TO REDUCE POSTOPERATIVE THROMBOSIS AND EMBOLISM

Of the several factors predisposing to postoperative thrombosis, much attention has been paid lately to the changes in the composition of the blood. These have recently been summarized as follows:[8] an increase in the number of platelets occurs regularly after any major operation, with a maximal peak between the eighth and eleventh days; there are an increase in fibrinogen, a shift of the albumin-globulin ratio in favor of the globulins and an increase in blood viscosity. All these factors facilitate the agglutination of platelets. The coagulation of the blood is favored by the postoperative leukocytosis and the increase in platelets, both of which liberate thrombokinase and hasten the coagulation of stagnating blood adjoining an obstructing platelet thrombus.

The importance of clean, sharp dissection, avoidance of undue trauma to the tissues, and the possible elimination of sources of infection have been repeatedly emphasized. That age, overweight and operations on the lower part of the abdomen, the pelvis and the lower extremities predispose to thrombosis is common knowledge. Climate, barometric pressure, too much intravenous medication and diet are factors worthy of discussion. But little attention has been paid to counteracting the marked retardation of blood flow

TABLE 4.—*Precipitating Factors in Producing Embolism*

Bowel movement	15
Getting in and out of wheelchair	6
Morning care	5
During or immediately after operation	3
Nausea from smelling ether	1
Insertion of Levine tube	1
Hiccup	1
No obvious cause	70
Total	100

TABLE 5.—*Number of Pulmonary Embolizations in 100 Cases*

Number of Emboli	Number of Patients*
1	61 (5)
2	27 (3)
3	7 (2)
4	2 (1)
5	2 (1)
6	1 (1)
	100 (12)

* Figures in parentheses indicate nonfatal emboli.

which occurs after every major operation and after childbirth. Yet every textbook dealing with thrombosis depicts the slowing of the circulation resulting in the narrowing of the axial stream, with the leukocytes and later the platelets assuming a marginal position.

Stagnation of venous blood alone will not produce an agglutination of platelets or their fixation to the vessel wall unless other factors are in operation. Nevertheless it is one of the most important and most readily controllable factors in postoperative thrombosis. The veins of the pelvis and the lower extremities are the most favorable sites for stasis. In patients immobilized in bed, the drainage from the femoral vein is slow. Superficial breathing and intestinal distention further interfere with adequate venous drainage. Tight abdominal binders and a motionless rigidity due to postoperative pain do not encourage venous backflow.

TABLE 6.—*Partial Embolization of the Pulmonary Arterial Tree Producing Death*

Case, Age, Sex	Symptoms Preceding Death	Time Interval Between First Symptoms and Death	Postmortem Observations
E. M. 64 ♀	Restlessness, hemoptysis, fall in blood pressure	7½ hours	Mural thrombi left and right ventricle, embolism right pulmonary artery
J. R. 58 ♀	Dyspnea, pulmonary edema, fall in blood pressure	15 hours	Thrombosis of uterine veins, right upper lobe infarct, embolus in right auricle and ventricle
M.H. 60 ♀	Severe dyspnea and cyanosis	4½ hours	Embolus left pulmonary artery
H. H. 65 ♂	Cyanosis, dyspnea, loud heart tones on right, fall in blood pressure	3 days	Multiple thrombi of the smaller arteries, hemorrhagic infarct right lung, fatty myocardium
P. W. 42 ♂	Dyspnea, chest pain, feeling of choking	13 hours and 40 minutes	Obliterating thrombosis of a main branch of right pulmonary artery, infarct lower lobe right lung
A. J. 38 ♀	Pallor, syncope, diaphoresis following straining after enema, pulse and respiration slowed down	45 minutes	Obliterating embolus of second division of right pulmonary artery, thrombosis right perirenal vein
B. M. 42 ♀	Acute gastric dilatation, emesis, cyanosis and dyspnea	35 minutes	Molded emboli of the right auricle and right pulmonary artery, atelectasis of the lungs, partially organized thrombi right common iliac vein
C. McD. 61 ♀	Dyspnea, apprehension, cold and clammy skin	3 hours and 10 minutes	Molded blood clots in right ventricle and branches of the left pulmonary artery, small mural thrombus left hypogastric vein

Recently two important monographic studies by Frimann-Dahl[9] shed very accurate information on the movements of the diaphragm and on the retardation of venous flow after operations. This author followed the respiratory excursions of the diaphragm before and several times after the operation in twenty cases and found that from one to twelve days after the operation there is a very marked reduction in the movements of the diaphragm. This is especially true in upper abdominal operations, the site of the surgical wound affecting the homolateral diaphragm very conspicuously. In this connection the experimental work of Nissen and Wustmann[10] is interesting. These workers determined the emptying time of the inferior vena cava before and after phrenicotomy and found that the disappearance time of the contrast material doubled after the diaphragm was paralyzed. Frimann-Dahl further determined the emptying time of the saphenous vein before and after operation and in patients who have been bedridden for a long time. He injected a small amount of opaque substance into the saphenous vein and watched its disappearance under fluoroscopy. Normally this took from five to thirty seconds. Bedridden patients, unless they had toxic thyroids, showed a

8. de Takats, Geza: Chapters on Thrombosis and Embolism, in Christopher, Frederick: Textbook of Surgery, ed. 2, Philadelphia, W. B. Saunders Company, 1939.

9. Frimann-Dahl, J.: Diaphragmabewegungen und der postoperative Venenstrom, Acta chir. Scandinav., 1935, supp. 36, pp. 1-168.

10. Nissen, R., and Wustmann, O.: Der Einfluss pathologischen Zwerchfellstandes auf die Blutstromung in der unteren Hohlvene, Deutsche Ztschr. f. Chir. 203-204: 42, 1927.

retardation to from one to two minutes, whereas after major abdominal operation the emptying time was prolonged to from three and one half to four minutes. This retardation was noticeable on the day following the operation but gradually increased up to the fifth or sixth day. In some cases the venous flow was practically stagnant up to the time when the patient first got up.

Fig. 1.—The afferent impulses travel mainly in the vagus and radiate back to the lung as bronchoconstrictor and bronchosecretory fibers. They may constrict the coronaries, produce vagal inhibition of the heart and depress blood pressure. They can radiate to the upper gastrointestinal tract and produce colics, increased peristalsis and reverse peristalsis. The plug may produce a stimulation of the sympathetic vasoconstrictors or a more general sympathetic stimulation through the dilation of the right heart (Bainbridge reflex). The hypertension in the right heart and in the pulmonary artery seems to be the main stimulus for these widespread reflexes, although the rise in intrapulmonary pressure, the congested lung and the irritated pleura all have been shown to act as reflexogenic factors. From Surgery **6**: 339 (Sept.) 1939.

Efforts have been made from time to time to prescribe postoperative exercises, to turn the patient from side to side several times a day, to encourage deep breathing, to improve circulation time by thyroid extract [11] and by digitalization of the failing heart. But a continuous gravity drainage of the endangered venous bed, aside from occasional notes in the Scandinavian literature, had not been advocated until the emphasis of Gray on the postoperative use of the Trendelenburg position.[12] He raised the foot of the bed approximately 10 inches (25 cm.) for the first twenty-four hours after operation with the view of improving pharyngeal and bronchial drainage and to encourage venous return from the extremities. He used this position for 276 patients, using a large control group of 3,153 patients for whom this position was not employed, and found a 30 per cent reduction in the morbidity rate of pulmonary complications. As a postural drainage of beginning pulmonary complications this position may really be worth while. Lueth [13] completed the study of 101 pulmonary abscesses treated by from 5 to 10 degrees of a Trendelenburg position with striking results. He also gave some valuable practical hints as to the proper bedding and the prevention of raising the chest and head by pillows and thereby producing a jackknife position.

Since Gray's communication, we have placed all patients after a major operation in a Trendelenburg position for twenty-four and occasionally for forty-eight hours (figs. 2 and 3). Excluded from such a position must be patients with intra-abdominal suppuration or with cardiac failure when such a position would lead to dyspnea. A 5 per cent angle can be readily accomplished by elevating the foot of the bed for from 8 to 10 inches (20 to 25 cm.). In case of shock this angle is usually increased to 10 degrees by doubling the elevation.

In the last five years 350 patients have been placed in this position at St. Luke's Hospital and the Illinois Research and Educational Hospitals. There was no postoperative thrombosis in this group, and the incidence of pulmonary complications as detected by clinical examination was 3 per cent. At the same time a group of 1,000 surgical cases at these institutions showed five cases of postoperative thrombosis. It was difficult to get adequate data of postoperative pulmonary complications, but they were marked in the charts in 28 per cent. It is obvious that our limited material is not well comparable to the control groups, as there were no pelvic laparotomies and prostatic operations on aged patients among the 350 cases; while suggestive, it does not permit any conclusions.

Besides diaphragmatic movements and abdominal distention, the inactivity of these patients is an important factor. To overcome this and to improve venous backflow by active muscular contractions, we have used ordinary bicycle pedals that are mounted to the foot end of the bed. The two shafts of the pedal have to be balanced. A washer prevents undue friction, and the pedals are placed in a wooden frame with a bracket reinforcement (fig. 4). The pedals can be tightened or loosened so that they can be used with more or less resistance. The patients pedal on this stationary bicycle for five minutes three times a day, starting on the third postoperative day. As we believe in relieving postoperative pain by enough morphine to insure deep breathing and avoid motionless rigidity in one position, only seldom has any objection been raised on the part of the patient. In fact it serves in part as occupational therapy and encourages the patient to more active movement in bed. Regular breathing exercises and mild active movements of the lower extremities are equally effective.

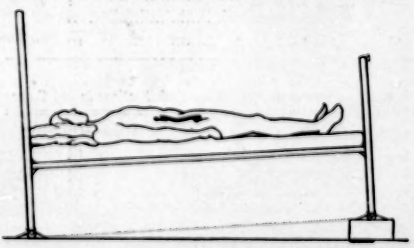

Fig. 2.—The foot of the bed is elevated at an angle of 5 degrees. The venous backflow from the extremities and the pelvis is measurably accelerated.

This simple apparatus, which can be assembled easily for a few dollars, has also proved of value in mobilizing knee, ankle and hip joints, as an active vascular exercise and as a yardstick to measure intermittent claudication.

In case of a suspected or manifest venous thrombosis, the exercise is naturally contraindicated. Nor can it be used if the necessary amount of motion causes pain.

11. Walters, Waltman: Method of Reducing Incidence of Fatal Postoperative Pulmonary Embolism: Results of Its Use in 4,500 Surgical Cases, Surg., Gynec. & Obst. **50**: 154 (Jan.) 1930.
12. Gray, H. K.: The Use of the Trendelenburg Position in the Prevention of Postoperative Pulmonary Complications, Proc. Staff Meet., Mayo Clin. **9**: 453 (Aug. 1) 1934.
13. Lueth, H. C.: The Treatment of Lung Abscess as Judged by One Hundred and One Cases, Illinois M. J. **68**: 440 (Nov.) 1935.

Following acute suppurative processes requiring complete immobilization, its use is obviously out of place. But in the majority of instances it is a simple and efficient method to promote venous backflow and to counteract inactivity. Only a large group of statistics can show whether early mobilization really is capable

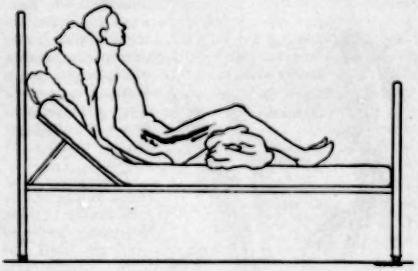

Fig. 3.—A frequent postoperative position. There is a stagnation of venous blood at Poupart's ligament and in the pelvis.

of reducing the incidence of postoperative thrombosis. Such statistics are now being gathered from the Department of Gynecology by Dr. William F. Geittmann.

THE MANAGEMENT OF PULMONARY EMBOLISM

In proposing any emergency measures in cases of pulmonary embolism, one must recognize that a correct diagnosis is not always made and only measures should be used which would do no harm even if pulmonary embolism were not present. Nygaard [14] in analyzing 289 deaths due to pulmonary embolism found that the diagnosis has been missed in 17.65 per cent of the cases. The causes of death in the erroneously labeled cases in order of their frequency were (1) cardiac failure and coronary occlusion, (2) indeterminate diagnosis, (3)

TABLE 7.—*The Effect of Atropine, Papaverine or Both on the Mortality from Pulmonary Embolism*

	Number of Cases	Survived	Percentage
Treated*	22	16	86
Control	100	13	13

* Cases of Burk, Denk, de Takats, Collins and Muller. The untreated series is our own.

shock and hemorrhage, (4) peritonitis, (5) pulmonary edema, (6) coma, (7) cerebrovascular accidents and (8) other conditions.

When cyanosis and dyspnea are the predominant symptoms oxygen by catheter, or preferably 100 per cent oxygen with the new mask of Boothby and his associates, is logical.[15] Our animal experiments showed that tracheal insufflation of oxygen protected some of the animals from death when a peripheral, asphyctic type of embolism was produced. It is common clinical knowledge that oxygen administration is helpful in cyanosis and dyspnea of pulmonary embolism. While our experience with 100 per cent oxygen in cases of pulmonary embolism is very limited, it should be more effective in raising the low oxygen saturation of the arterial blood than the customary administration of from 40 to 60 per cent oxygen. An oxygen tank should be available on every surgical floor.

The massive pulmonary embolism, however, is characterized by pallor, fall in blood pressure and retrosternal pain; there is hardly any cyanosis and the peripheral arterial blood shows a normal oxygen saturation. It is this syncopal type of embolism for which we advocate the use of papaverine and atropine; the former in doses of one-half grain (0.03 Gm.), the latter in doses of from $\frac{1}{60}$ to $\frac{1}{75}$ grain (0.001 to 0.0008 Gm.). Both drugs should be given intravenously, as absorption from subcutaneous or intramuscular sites is too slow in such patients. All surgical floors are equipped with one-half grain powders of papaverine and $\frac{1}{150}$ grain tablets of atropine, and the drugs are dissolved in a few cubic centimeters of physiologic solution of sodium chloride and boiled over a flame just before use. While ampules of papaverine are on the market, the stability of such solutions is variable and the drug is apt to be most potent when dissolved just before use.

Papaverine alone has been used previously in cases of pulmonary embolism (table 7). A comparison of such a small series of patients with a larger series not having received any medication is hardly absolute proof, but it does reveal the marked drop in mortality when papaverine is used. The addition of atropine we feel is important. It has been used in our service for over one year not only in the severe, massive types of embolism but following the milder infarcts as a pro-

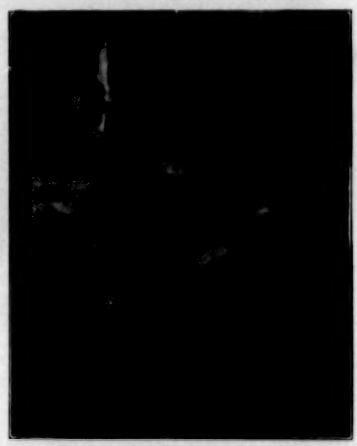

Fig. 4.—Bicycle pedals are mounted on the foot end of the bed. The amount of resistance is controlled by tightening or loosening the wooden frame.

phylactic dose, such patients receiving both drugs three times a day for several days.

The following history is illustrative:

Mrs. E. T., a Negro woman aged 33, had a syncopal attack of pulmonary embolism ten days after a cholecystectomy. The blood pressure fell from 120 systolic, 85 diastolic to 70/58. Atropine $\frac{1}{75}$ grain and papaverine one-half grain were given intravenously by Dr. John Lindquist thirty minutes after the

14. Nygaard, K. K.: Pulmonary Emboli: Consideration of Clinical Diagnosis and Possibilities for the Trendelenburg Operation, Proc. Staff Meet., Mayo Clin. **13**: 586 (Sept. 14) 1938.

15. Boothby, W. M.; Mayo, C. W., and Lovelace, W. R., II: One Hundred per Cent Oxygen: Indications for Its Use and Methods of Its Administration, J. A. M. A. **112**: 477 (Aug. 5) 1939.

onset of symptoms. The pulse immediately became stronger and the patient emerged from a seemingly moribund state; oxygen was started, which relieved the dyspnea. Seventeen days later, after an afebrile period of seven days, a second embolism occurred which again was aborted with atropine and papaverine. Six electrocardiograms are available for this period, taken one, two, eight, sixteen, twenty-three and thirty-two days after the onset of the first embolus (fig. 5). A seventh one was taken several months later.

COMMENT

Elsewhere [7] we have presented electrocardiograms of other patients which illustrate our belief (1) that small or significant electrocardiographic changes which are reversible may take place after pulmonary embolism, (2) that the fall in blood pressure is not responsible for these changes and (3) that the abnormal tracings are not caused by organic coronary occlusions. The latter point gains powerful support from the recent postmortem studies of Friedberg and Horn,[16] who found 31 per cent of myocardial infarctions without any coronary occlusion. Twelve cases were associated with pulmonary embolism. They felt that an acute coronary insufficiency caused the myocardial ischemia and the coronary insufficiency occurred because of the fall in blood pressure, the associated asphyxia and possibly exaggerated vagal reflexes. They stated that pulmonary embolism is most likely to cause myocardial ischemia

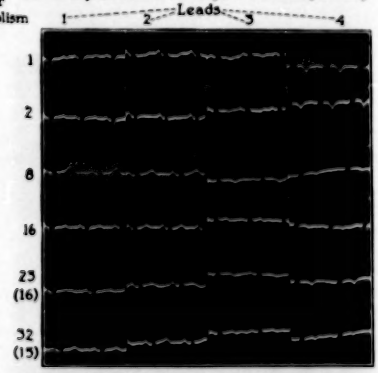

Fig. 5.—Electrocardiograms on E. T., a woman aged 33. Pulmonary embolism ten days after cholecystectomy. One day after severe massive pulmonary embolism; sino-auricular tachycardia; T_1 low, T_2 low, T_3 and T_4 inverted; deep Q_3; QRS complex low in leads 1, 2 and 3. Two days after embolism: sino-auricular tachycardia; T_1 and T_2 low, T_3 and T_4 inverted; deep Q_3. Eight days after embolism: sinus rhythm; T_3 and T_4 inverted; marked improvement as compared with first tracing. Sixteen days after embolism: sino-auricular tachycardia; deep Q_3; T_2 and T_4 depressed; as compared with previous tracing the ST segment in lead 1 is more nearly normal. There is less depression of T_2 and T_4. Twenty-three days after first, six days after second embolism: as compared with previous tracing, T waves are more depressed in all leads. Thirty-two days after first, fifteen days after the second embolism: sinus rhythm; ST segment slightly elevated; T_3 inverted; deep Q_3; as compared with previous tracing T_1, T_2 and T_3 more nearly normal; T_4 still inverted; marked improvement.

if there is recurrent embolization, if the coronary arteries are sclerotic, if the heart is previously hypertrophied and if there is adequate duration of life after the embolism.

This work was quoted in more detail because its conclusions, which resemble ours, have been reached from a purely morphologic approach. It is difficult to convince some pathologists of an acute coronary insufficiency with a consecutive myocardial ischemia, unless they can see the occluded artery. And yet the analogy with Raynaud's disease, in which gangrene may occur because of prolonged spasm of the digital vessels and without demonstrable obstruction to the arteries, is obvious.

Fig. 6.—P. de Vr., a man aged 44, had three pulmonary infarcts originating in a deep and superficial thrombophlebitis of the left lower extremity. Eighteen days after the first infarct the left saphenofemoral junction was exposed under local anesthesia in the patient's room. The tissues were edematous and the perivenous lymph glands were enlarged. The saphenous vein was thickened, hyperemic and surrounded by a periphlebitic exudate. A small section was excised close to the saphenofemoral junction and the femoral vein was probed both proximally and distally with a curved uterine forceps. While the distal portion seemed free, blood flowed under a very small stream from the proximal end. Following several probings and gentle massage from above, brisk flow occurred. No solid mass was actually recovered. The saphenous vein was tied flush with its junction. Skin clips were applied. The patient was reexamined three months later. He had no further infarcts. A slight thrombophlebitic edema had persisted up to that time and could be controlled with elastic support.

The concept that reflex cardiac deaths may occur, or that depressor reflexes originate from the acute pulmonary hypertension and reflex bronchial spasms, does not mean to belittle the importance of the obstructive plug in the artery, the successful removal of which has been possible only nine times in 132 attempts, a mortality of 93.2 per cent. It should be pointed out, however, that these embolectomies were all performed in the rapidly fatal cases, with the patient in a moribund state. Pilcher [17] has recently suggested that the slowly dying patients might be operated on two or three hours after the onset of symptoms, while not in a moribund state but showing no improvement. This would make pulmonary embolectomies not desperate, last minute attempts, but deliberate surgical procedures. From table 3 it can be seen that 60 per cent of our patients lived longer than one hour.

In cases of recurring infarcts, another surgical procedure must be considered; if the clot is recognizable and may be localized to one of the ileofemoral veins, its gentle extraction may be attempted through the saphenous vein (fig. 6). We have come to this decision after watching one patient die after the sixth and another after the eighth infarct. Two clearcut pulmonary infarcts from a well localizable source would prompt us again to expose the iliac vessels.

This procedure is not identical with ligation of the hypogastric or common iliac veins in septic thromboses. The limitations of that method have been the subject of previous controversy and are not germane to our present discussion of bland, static thrombi.

CONCLUSIONS

Postoperative thrombosis and embolism continues to be one of the unexpected and seemingly unavoidable complications of surgery. One of the predisposing

16. Friedberg, C. K., and Horn, Henry: Acute Myocardial Infarction Not Due to Coronary Occlusion, J. A. M. A. **112**:1675 (April 29) 1939.

17. Pilcher, R. S.: Slowly Fatal Pulmonary Embolism, Lancet **2**:942 (Oct. 22) 1938.

factors in thrombosis, namely retardation of venous return from the lower extremities and the pelvis, has been emphasized and a simple measure has been utilized partly to overcome stasis in the tributaries of the inferior vena cava. Because of our belief that reflexes originating from the occluded pulmonary arterial tree may contribute to the causes of death from pulmonary embolism we have suggested simple emergency measures which tend to inhibit such reflexes; for the cyanosis, oxygen inhalations are obviously helpful. In the slowly fatal cases of pulmonary embolism or in the recurrent embolizations to the lung from a well localizable source, surgical measures deserve serious consideration.

122 South Michigan Avenue.

THE RELIEF OF SYMPTOMS OF MAJOR TRIGEMINAL NEURALGIA (TIC DOULOUREUX)

FOLLOWING THE USE OF VITAMIN B_1 AND CONCENTRATED LIVER EXTRACT

HENRY BORSOOK, PH.D., M.B.
M. Y. KREMERS, M.D.
AND
C. G. WIGGINS, D.D.S.
PASADENA, CALIF.

The present report concerns a study, extending over more than a year, of the effects of massive vitamin therapy in the relief of major trigeminal neuralgia in fifty-eight cases of tic douloureux, four cases of sphenopalatine neuralgia and nine cases of "atypical facial neuralgia."

One reason that led us to undertake this study was an experimental and physiologic interest in the possible effectiveness of vitamin B_1 in the relief of tic douloureux, in view of the effectiveness of this vitamin in relieving the polyneuritis of chronic alcoholism and pregnancy.

Another reason was the desirability of finding, if possible, some alternative to the most effective treatment yet available for tic douloureux, partial or total section of the sensory root of the gasserian ganglion. Adequate surgical therapy is not available to many sufferers with this disease; in some the pain, though extremely troublesome, is hardly so severe as to persuade the patient to submit to the necessary operation. Another occasional limitation of surgical therapy is that when the first division of the fifth nerve is involved the necessary total section of the sensory root incurs grave danger of loss of the eye on the affected side.

Present palliative treatments of trigeminal neuralgia are, on the whole, unsatisfactory. Inhalation of trichloroethylene, which relieves some sufferers at first, frequently becomes totally ineffective later. The other commonly used palliative treatment, alcohol injection of the trunk of the nerve, often affords relief repeatedly for periods varying from months to years. Yet many patients have reported to us their failure to obtain relief from alcohol injection. Whether this was the fault of the operators or of some peculiarity of their condition we were unable to determine.

The advantages of the treatment which we have evolved are that it is available everywhere or can be easily made so, and that it can be administered by any practitioner and, with some instruction, even by the patient himself.

This treatment may be divided into two parts: (1) active therapy and (2) modification of diet, with some nutritional supplements. The active therapy consists of intravenous injection of 10 mg. daily of thiamin chloride. Vitamin B_1 is as effective by the intramuscular route as intravenously.

About 25 per cent of our patients failed to respond satisfactorily to the vitamin B_1 therapy alone. Recalling the improvement in cases of pernicious anemia with spinal cord degeneration following the injection of concentrated liver extracts, we have been administering a liver extract to the group of patients slow to recover with vitamin B_1 alone. This extract (15 U. S. P. anti-anemia units per cubic centimeter) is given in 0.5 cc. doses intramuscularly thrice weekly.[1] These patients therefore obtain 22.5 U. S. P. units weekly. The results that we have obtained have encouraged us to continue its use.

Some trials were made with a cruder liver extract (Lilly, 1 U. S. P. unit per cubic centimeter) weaker in the anti-pernicious anemia principle but richer in other liver factors. This appeared to be less effective than the purer product containing a high concentration of anti-pernicious anemia principle.

For those patients who have had insufficient relief after several months' treatment with vitamin B_1 and liver injections we are inclined to recommend the daily injection of 100 mg. instead of 10 mg. of vitamin B_1. There are a few cases, but only a few according to our experience, in which this massive dose is necessary. We have not observed any signs of toxicity following the intravenous injection of 100 mg. of thiamin chloride daily for months.

The diet consists of a high vitamin-low carbohydrate diet.[2] In addition to a routine physical and neurologic examination the blood was studied (hemoglobin, cells and Wassermann reaction), and roentgenograms were taken of the head to exclude possible dental abnormality as a cause of the pain.

In most but not all cases the diet was supplemented by 1 ounce (30 cc.) daily by mouth of an aqueous concentrate of rice polishings[3] which provided 1,500 international units of vitamin B_1 and abundant amounts of other members of the vitamin B complex. This supplement was prescribed in order to enrich the diet with the vitamin B complex and to avoid in some measure an imbalance in the complex as a consequence of the administration of such large amounts of vitamin B_1. Some of our patients showed marked improvement with vitamin B_1 alone without this supplement. In others, on the other hand, improvement of symptoms occurred only after the supplementary vitamin B complex was taken for some time. We are unable at present to evaluate the relative contribution to the relief of pain of the different members of the vitamin B complex. It

This study was aided by a grant from the Hixon Fund.
From the William G. Kerckhoff Laboratories of the Biological Sciences, California Institute of Technology.
A brief report of this work was read at the National Academy of Sciences, Washington, D. C., in April 1939. An abstract was published in Science (89: 439 [May 12] 1939).

1. This material was donated by Eli Lilly & Co.
2. Borsook, Henry; Daugherty, Paul; Gould, A. A., and Kremers, E. D.: The Vitamin B Complex and Functional Chronic Gastrointestinal Malfunction: A Study of Two Hundred and Twenty-Seven Cases, Am. J. Digest. Dis. & Nutrition 5: 246 (June) 1938.
3. This material and all the thiamin chloride used in this study were donated by the Galen Company, Berkeley, Calif.

appears that the most important contribution in this respect is the vitamin B_1 administered.

In about one third of the cases the diet was supplemented by a daily dose of a fish liver oil containing approximately 9,400 units (U. S. P. XI) of vitamin A and 1,700 units (U. S. P. XI) of vitamin D.[4] There is no evidence in our series of cases of any therapeutic benefit from this supplement.

Patients report for treatment and observation six days a week until they have been free of pain for one month, after which they report progressively less frequently. The question of the amount of active therapy necessary after symptoms have disappeared will be discussed.

TABLE 1.—*Summary of Results in Cases of Tic Douloureux Under Observation for Fourteen Months*

Result	No. of Patients
Markedly improved	9
Improved	6
Slightly improved	1
Not improved	1
Had therapeutic remission longer than any spontaneous remission in the 2 years prior to beginning of treatment	7

Only seven patients have used analgesics or sedatives, even in the earliest stages of treatment. One patient still uses phenobarbital when the pain is very severe; codeine was administered a few times to another, morphine twice to a third and salicylates infrequently to four patients.

In appraising the effectiveness of any therapeutic agent or procedure in major trigeminal neuralgia the tendency to spontaneous remission, i. e. without treatment, must be taken into account. For this reason, in summarizing the results obtained in the treatment of tic douloureux, the variety of trigeminal neuralgia with which we have occupied ourselves most, we have divided the subjects into two groups: a group of eleven patients who have been under observation for thirteen months and a group of forty-seven patients who have been under treatment and observation for from six to eight months.

Table 1 shows the results at the time of writing for the first group. The significance of the different categories is as follows: "markedly improved," the patient has had no pain or only slight soreness or hyperesthesia for two months or more; "improved," the patient is fairly comfortable but there are occasional brief twinges of moderate pain or there is still some definite soreness. The patient is able to eat, talk and sleep without discomfort or his condition is really "markedly improved" but this status has not been maintained long enough for him to be included in the latter category. The other two categories need no explanation.

Of the nine patients listed as "markedly improved" in table 1, six have maintained this condition during the last nine months without any parenteral treatment. They are taking daily by mouth 1 ounce of the liquid vitamin B complex concentrate, which supplies 1,500 international units of vitamin B_1. Three of the nine patients had relapses which were relieved within two weeks by resumption of parenteral therapy. This treatment was continued for one month after the pain had disappeared.

4. E. R. Squibb and Sons donated some of this material.

With seven of the nine markedly improved patients in table 1 the remission which occurred in the course of treatment has been longer than any occurring in the two years prior to the beginning of treatment. We feel justified, therefore, in crediting to the treatment the remission which occurred during its course.

Table 2 is a summary of the results for the larger group, who have now been under observation for from six to eight months. In the light of our experience with the group of patients in table 1, we may expect that some of those now only improved or slightly improved will later justify inclusion in a higher category. About two thirds of those improved or markedly improved have now experienced relief of pain for a longer period than in the two years prior to the beginning of treatment. One of the two patients not improved has been operated on and now has recurrence of severe pain. The second is a man 87 years old. He was operated on for pain on the right side more than twenty years ago. He has had no recurrence on this side. His present pain is on the left side. Following peripheral surgical treatment there is some paralysis of the facial muscles on this side and he is troubled by excessive saliva, which he cannot prevent from running over his semiparalyzed lower lip. He obtains complete relief from alcohol injection of the nerve which lasts for about two years.

In one of the patients designated as markedly improved in table 1, the improvement set in only after the liver injections were begun. The slightly improved patient has been receiving liver for six months. In ten of the forty-three patients classified in table 2 as markedly improved or improved a definite change occurred after they began to receive the liver injections. It must be added that the patients comprising the group in table 2 were not given vitamin B_1 injections alone for as long a time as those in table 1. This was done to test whether the addition of the injection of liver concentrate would shorten significantly the period of active treatment required. This was not the case. Our present experience is too limited for a definite conclusion on the value of the liver therapy here. The present indications are that in a minority of cases significant improvement is not obtained without liver therapy but that by this additional treatment the period in which the parenteral therapy with vitamin B_1 is required is not shortened.

TABLE 2.—*Summary of Results in Cases of Tic Douloureux Under Observation for from Six to Eight Months*

Result	No. of Patients
Markedly improved	28
Improved	15
Slightly improved	2
Not improved	2
Had therapeutic remission longer than any spontaneous remission in the 2 years prior to beginning of treatment (markedly improved and improved)	31

There is great variation in the speed at which different patients respond to treatment. Taking all the subjects together, nine were markedly improved after one month of treatment, nine after two months and eleven after three months. In a minority of those who have become markedly better this improvement did not occur until after four to six months. We have not as yet found anything in the symptoms or clinical history from which we can predict the course of recovery of any

patient. Age, sex, severity or duration of symptoms and clinical history afford no criterion.

Two features have characterized the course of recovery in nearly every case. The first is that, after the sharp stabbing or burning pain has stopped, the patients report a persistent soreness over a fairly wide area which includes the "trigger points." Unlike the paroxysms of sharp pain, the soreness is felt most of the day. Gradually the area of soreness is reduced; the areas from which it disappears last are the trigger points. At the same time the soreness becomes less severe, is experienced for a shorter time each day and finally disappears entirely.

A second common feature in the course of recovery is that relapses occur. These become progressively less severe and of shorter duration.

Among the questions which arise, one is How permanent is the relief attained by means of this treatment? It will be at least another year before a satisfactory answer can be given. It is certain that patients will vary. It seems at present that those who respond quickly (within one month) may be maintained free from pain by taking daily 1 ounce of the concentrated liquid vitamin B complex we have been using, which provides 1,500 international units of vitamin B_1. Our present limited experience indicates that those who responded slowly will continue to need injections of large amounts (10 mg. daily) of vitamin B_1 indefinitely. The price of vitamin B_1 is continually declining, so that this need not be prohibitively costly.

Of the thirty-six patients who were markedly improved, five have relapsed after from three to nine months of freedom from pain. In four of these the severe pain was relieved within one or two weeks after resumption of parenteral treatment, after which the residual soreness gradually disappeared.

We have tested the treatment just described on four patients with sphenopalatine neuralgia (Sluder's syndrome); two of these are markedly improved and two improved.

In nine cases we have diagnosed the condition as atypical facial neuralgia. There was possibly moderate improvement in three cases and no improvement in six.

There are a number of reports in recent literature on the relief of the pain of trigeminal neuralgia following the injection of vitamin B_1. Von Lobenstein [5] reported one case in which from six to ten intramuscular injections and two or three intravenous injections of 400 pigeon units each were given, the injections being separated by two or three days. Böhm [6] treated four cases with approximately the same dosage for the same length of time. Freedom from pain was obtained in two and no improvement in two. Vorhaus [7] mentioned, without any details of treatment, improvement of five cases in which recurrence followed operation. Complete relief of symptoms occurred in three and improvement in two while vitamin B_1 was still being taken. Schwochow [8] reported improvement in cases of facial paresis with pain following injection of vitamin B_1. Molnár [9] described one case of trigeminal neuralgia relieved after the daily injection of 400 pigeon units for nine days. In this case the pain reappeared when the patient returned home.

We are convinced from our experience that the dosages just mentioned and the short period of treatment would have failed to bring relief in most of our cases. Further, the reports cited do not indicate how long the cases were followed. Some of these may have been similar to the nine in our series in which response occurred very quickly—within one month.

Our present series of fifty-eight patients with tic douloureux consists of forty-seven women and eleven men. All but eight are over 50 years of age; one was 21 when treatment was begun; eleven are over 70. Some have had the disease for more than twenty years. Among those who are markedly improved there are seven who are over 70.

The locus of the lesion in tic douloureux is still the subject of debate. Dandy [10] is of the opinion that in many cases pathologic change of etiologic significance is demonstrable in the region of the sensory root of the fifth nerve. Lewy, Frazier and Rowe,[11] on the other hand, favor the corticothalamic tracts as the site of the lesion. In this connection, i. e. as to whether the lesion is peripheral or central, it is interesting to compare the results just reported with those obtained in severe alcoholic neuritis, which is an undoubted peripheral neuritis, following massive parenteral B_1 therapy. In the latter condition pain is relieved much sooner (in about ten days) than in most of our cases of trigeminal neuralgia. On the other hand the paresthesias, wrist drop and ankle drop persist for months. Recovery here often proceeds at a rate comparable to that in most of the cases just reported—e. g. if the persisting "soreness" in our cases is considered as a paresthesia.

Textbook descriptions of tic douloureux give the impression that the pain is always terribly severe. From our experience this is an exaggerated picture. The pain is always troublesome, but there are many cases in which it never attains dramatic and terrifying intensity.

There is another point which our observations indicate should be added to the usual description of this disease. It is usually stated that between paroxysms there is no pain. Many of our patients have described a postparoxysmal soreness which may persist for minutes or hours.

SUMMARY

1. Fifty-eight patients with tic douloureux have been treated with large doses of vitamin B_1 and in some cases in addition with concentrated liver extracts rich in the anti-pernicious anemia principle.

2. These patients have been under observation for from six to fourteen months. So far thirty-seven are markedly improved, fifteen improved, three slightly improved and three not improved. Of the fifty-two patients markedly improved and improved, thirty-eight had a remission in the course of and after active therapy which was longer than any spontaneous remission during the two years prior to the beginning of treatment.

3. Four patients with sphenopalatine neuralgia obtained no improvement; three patients may have had some slight improvement.

5. von Lobenstein, Hofer: Vitamin B_1 Avitaminose, ihre Beziehung zu neuritischen Affektionen und deren Behandlung mit Betaxin, München. med. Wchnschr. **83**: 510 (March 27) 1936.

6. Böhm, J.: Erfahrungen mit Betaxin bei Nervenkrankheiten, Psychiat.-neurol. Wchnschr. **38**: 418 (Aug. 22) 1936.

7. Vorhaus, M. G.: The Present Evaluation of Vitamin B_1 Therapy, Am. J. Digest. Dis. & Nutrition **2**: 915 (Feb.) 1937.

8. Schwochow, Paul: Erfahrungen mit Betaxin und der Behandlung von Neuritiden und Polyneuritiden aller Art, München. med. Wchnschr. **84**: 98 (Jan. 15) 1937.

9. Molnár, Stefan: Die Behandlung mit Vitamin B_1 bei Nervenkrankungen, Klin. Wchnschr. **16**: 1022 (July 17) 1937.

10. Dandy, W. E.: Diagnosis and Treatment of the Cranial Nerves, Rocky Mountain M. J. **35**: 282 (April) 1938.

11. Lewy, F. H., and Frazier, C. H.: The Disturbances of the Time Relation to Sensitivity in Major Trigeminal Neuralgia, A. Research Nerv. & Ment. Dis., Proc. **18**: 497, 1938. Frazier, C. H.; Lewy, F. H., and Rowe, J. N.: The Origin and Mechanism of Paroxysmal Neuralgic Pain and the Surgical Treatment of Central Pain, Brain **60**: 44 (March) 1937.

THE USE OF BULK ETHER IN SURGICAL ANESTHESIA

THE STABILITY OF ETHER IN CORK-STOPPERED METAL CONTAINERS

ELLA M. HEDIGER, M.D.
MAYNARD B. CHENOWETH, A.B.
AND
HARRY GOLD, M.D.
NEW YORK

The belief prevails that U. S. P. anesthetic ether deteriorates very quickly and is unfit for anesthesia twenty-four hours after the container is opened. In 1934 a study was reported by the Golds [1] showing that this view is based on a misconception, that certain facts concerning deterioration of ether have been misapplied in practice. It is well known that when exposed to heat, sunlight, air and certain catalytic agents ether oxidizes with the formation of impurities. However, they showed that ether fails to develop any impurities detectable by very delicate tests when the sealed metal containers in which anesthetic ether is supplied by E. R. Squibb & Sons, Mallinckrodt Chemical Works and Merck & Co., Inc.,[2] are opened repeatedly, stoppered with cork and kept at ordinary room temperature for weeks. The same was found to be true of U. S. P. ether (Mallinckrodt) supplied in large drums of 27 and 55 pounds.

After it had been shown that chemically no appreciable change takes place in bulk ether under these conditions, the matter was examined clinically and the results of a clinical study were reported the following year (1935) by Hediger and Gold.[3] This was made in the endeavor to learn whether U. S. P. ether in bulk

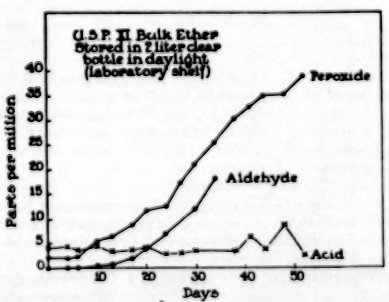

Fig. 1.—Deterioration of U. S. P. XI bulk ether stored in 2 liter clear bottle in daylight (laboratory shelf).

after its exposure to air by frequent opening and stoppering of the container with cork produced satisfactory anesthesia. The analysis of 702 surgical anesthesias with ether in that study showed that the Mallinckrodt bulk ether placed in anesthetic ether cans stoppered with cork not only remained chemically pure for a long time but was clinically indistinguishable from ether in the small sealed containers. It was pointed out that there was no basis in fact for the belief that ether spoils rapidly after the container is opened and that even several weeks later the ether in the tin cannot be distinguished from the product in the tin immediately after it is opened. It was also noted that, without the slightest risk to the patient, the cost of anesthetic ether to the hospital could be greatly reduced by the use of anesthetic ether in bulk, since such ether costs only about one fifth of that in small tins.

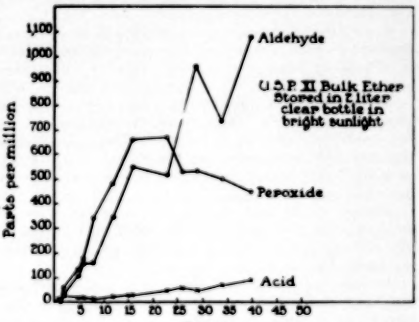

Fig. 2.—Deterioration of U. S. P. XI bulk ether stored in 2 liter clear bottle in bright sunlight.

While this suggestion had not been universally received with favor,[4] the observations were confirmed in a similar clinical comparison of bulk ether and ether in small sealed containers by Dooley and his associates [5] in Syracuse, N. Y. They stated that from their results "it seems evident that small can special ethers at a high cost offer no advantages over bulk ether U. S. P. either in safety or in efficiency." Morrison [6] reported that U. S. P. bulk ether transferred to cans stoppered with cork has been used for anesthesia in a routine manner for nearly three years at the Illinois Research Hospital in Chicago with entirely satisfactory results. Similarly, bulk ether has proved entirely satisfactory and has completely replaced small can ether for surgical anesthesia at the Mount Sinai Hospital in New York during the past three years.[7]

On the labels of the older ether cans (Squibb) there appeared a statement to the effect that the ether should not be used for anesthesia after the container was opened and the ether exposed to air "for twenty-four hours or more." During recent years the twenty-four hour clause disappeared from the labels and in its place there was a less definite statement to the effect that the ether should not be used for anesthesia after the container was opened and the ether exposed to air "for

From the Department of Pharmacology of Cornell University Medical College, and the Department of Surgery of Cornell University Medical College and the New York Hospital.

1. Gold, Harry, and Gold, David: Stability of U. S. P. Ether After the Metal Container Is Opened, J. A. M. A. **102**: 817 (March 17) 1934.

2. These were the only brands used in our tests, although there is at present no reason for supposing that the facts do not apply to others as well.

3. Hediger, Ella M., and Gold, Harry: U. S. P. Ether from Large Drums and Ether from Small Cans Labeled "For Anesthesia": Comparison in Seven Hundred and Two Operations, J. A. M. A. **104**: 2244 (June 22) 1935.

4. Bulk Ether Warning, editorial, Mod. Hosp. **44**: 110 (March) 1935. Doctors and Ether, editorial, Drug and Cosmetic Industry **34**: 338, 1934.

5. Dooley, Marion S.; Wells, C. J.; Frey, J. C.; Knoff, F. H.; Gable, W. J.; Mordell, J. S.; Beuttner, J. J.; McElwain, C. E., and Bentley, C. D.: Clinical Comparison of Drum and Special Ethers, J. A. M. A. **105**: 1033 (Sept. 28) 1935.

6. Morrison, S. W.: Problems of the Hospital Pharmacist, Hospitals **12**: 27 (June) 1938.

7. Turner, Joseph, Director of the Mount Sinai Hospital, New York: Personal communication to the authors.

some time." On the most recent labels, which came to our attention in April 1939, however, we note that the twenty-four hour clause has been reinstated. The question of rapid deterioration of ether was reopened in a recent report by Aurelius, Herlong and Nitardy,[8] of E. R. Squibb & Sons, who stated that their ether deteriorated rapidly when stored in cans stoppered with cork. In most of their specimens only traces of impurities developed not susceptible of detection by the U. S. P. XI tests for purity. Furthermore, no statement was made regarding a crucial factor in the experiment, namely the type of containers in which the ether was stored. It is well known that improper containers may accelerate the oxidation of ether, and in the previous reports[9] care was taken to emphasize the fact that the stability of ether after the container is opened and stoppered with cork applies to the containers in which the well known brands of anesthetic ether are supplied at the present time in this country. It is not possible, therefore, to know what bearing their results have on the practical aspect of the position we have taken, namely that U. S. P. ether in bulk supplied to the operating room in cork-stoppered anesthetic ether cans involves no compromise with the purity of the ether or with the safety of the patient.

Nevertheless, in view of the practical importance of the matter, a program was undertaken to extend our previous work, from both the chemical and the clinical standpoint, to determine by quantitative tests for impurities the speed of deterioration of ether under a variety of conditions and to compare the merits of bulk ether transferred to cork-stoppered ether tins with ether in small sealed metal containers in a larger series of surgical anesthesias. The results of these investigations form the subject of the present report.

TABLE 1.—*Rate of Formation of Impurities in U. S. P. XI Bulk Ether Stored Under Various Conditions*

No. of Specimen	Containers	Manner of Storage*	Frequency of Testing†	No. of Days Stored	Highest Concentration of Impurities in Period of Storage, Parts per Million			Days Stored Before Impurities Appeared				Days Before U. S. P. XI Qualitative Tests Became Positive‡	
								Peroxide		Aldehyde			
					Peroxides	Aldehydes	Acids‡	Days	Amount, Parts per Million	Days	Amount, Parts per Million	Peroxide	Aldehyde
9	27 lb. drum	Refrigerator	2 weeks	64	0	0	13-19	64	0	64	0	0	0
10	2 liter amber bottle	Dark closet (room temperature)	3-4 days	63	7.1	1+	7-23	34	2.3	9	1+	0	0
11	2 liter clear bottle	Dark closet (room temperature)	3-4 days	44	13.6	10	9-29	7	2.5	9	1+	19	26
12	2 liter clear bottle	Daylight (laboratory shelf)	3-4 days	44	6.8	3	5-20	7	3	7	2	26	0
13	2 liter clear bottle‖	Daylight (laboratory shelf)	3-4 days	52	38.8	18	6-21	10	5.5	17	2	..	..
14	2 liter clear bottle	Bright sunlight	2-3 days	63	670	2,760	11-153	2	62	2	31	2	2
15	2 liter amber bottle	Bright sunlight	2-3 days	40	41.2	10	4-17	2	1.5	2	1	19	70

* Temperature range at place of storage: room temperature, 25-32 C.; refrigerator, 6-10.5 C.; sunlight, 29-48 C.; closet, 25-32 C.

† Most specimens were tested after the first and second day of storage, and then this schedule was followed.

‡ The figures for the acids fluctuated widely and irregularly. Only in specimen 14 do they appear to be significant, having risen more or less progressively from the sixteenth to the sixty-third day. In a typical case (specimen 10) the fourteen tests for acid in a period of fifty-seven days gave the following results: 15.6, 16.2, 13.8, 13.8, 7.8, 10.2, 18.0, 23.4, 15.6, 10.8, 7.8, 7.4, 10.2, 10.8.

§ Those which never became positive are indicated by a zero.

‖ This specimen was stoppered with a glass stopper and sealed with stopcock grease. The others were stoppered with cork.

TABLE 2.—*Rate of Formation of Impurities in U. S. P. XI Ether (Labeled "For Anesthesia") After the Metal Container Is Opened and Stoppered with Cork*

No. of Specimen	Brand	Containers		Manner of Storage	No. of Days Stored	Frequency of Testing*	Highest Concentration of Impurities, Parts per Million		
		No. of Cans	Size				Peroxides	Aldehydes	Acids
1	Mallinckrodt	1	5 lb.	Refrigerator	58	Weekly	0	0	4
2	Mallinckrodt	1	5 lb.	Refrigerator	59†	Biweekly	0	0	6
3	Mallinckrodt	1	1 lb.	Room temperature	14‡	Biweekly	0	1	7
4	Mallinckrodt	1	5 lb.	Room temperature	75	5 days	0	0	11
5	Merck	1	5 lb.	Room temperature	59	Weekly	0	0	8
6	Merck	1	5 lb.	Refrigerator	41	Weekly	0	0	13
7	Squibb	3	1 lb.	Refrigerator	49	Weekly	0	1	9
8	Squibb	3	1 lb.	Room temperature	66	Weekly	0	0	15

* Most specimens were tested after the first and second day of storage, and then this schedule was followed.

† Ground cork placed in can.

‡ So lightly stoppered that ether evaporated.

CHEMICAL STUDY

1. *Methods of Testing.*—Peroxides: The method of Green and Schoetzow[10] with some modifications was employed. In the early experiments absolute alcohol was used to render the aqueous solution of sodium thiosulfate miscible in ether. However, 95 per cent alcohol (U. S. P.) was found equally satisfactory, and

8. Aurelius, J. E.; Herlong, E. S., and Nitardy, F. W.: Chemical Stability of Anesthetic Ether, J. Am. Pharm. A. **26**: 45 (Jan.) 1937.

9. Harry and David Gold.[1] Hediger and Gold.[2]

10. Green, L. W., and Schoetzow, R. E.: A Method for the Quantitative Determination of Minute Amounts of Peroxides in Ether, J. Am. Pharm. A. **22**: 412 (May) 1933.

this was used in the subsequent experiments. Blank tests for peroxides were made in the case of all alcohol for each ether test. The sodium thiosulfate was standardized by the method of Wenger, Cimerman and Rzymowska.[11]

Aldehydes: The method of Carey, Green and Schoetzow [12] with some modifications was employed. Control tests showed that we were able to detect 1 part of acetaldehyde in 1,000,000 parts of ether. The fuchsin-sulfurous acid was prepared according to the method of the British Pharmacopeia of 1914. If there remained a slight amber tint in the reagent it was removed by shaking for thirty seconds with 0.5 Gm. or less of animal charcoal per liter. Very little dye is removed from the reagent in this way and its value is unimpaired by this loss, since the same sample of fuchsin-sulfurous acid is used for both the standard and the test samples of ether. The primary standards were aqueous solutions of acetaldehyde, made to contain 1 Gm. of acetaldehyde in 100 cc. of distilled water. These were prepared by adding 5 cc. of pure acetaldehyde (B. P. 21 C.) from a buret and distilled water to make 25 cc. in a volumetric flask. On the basis of the specific gravity of pure acetaldehyde at 20 C., 6.4 cc. of this solution would then be diluted to 100 cc. with distilled water in a volumetric flask to make the final primary standard solution. The usual corrections for changes in volume of the acetaldehyde with temperature were made when the temperature varied significantly from 20 C. Carey, Green and Schoetzow [12] made their primary standard solutions in aldehyde-free alcohol instead of in water. The aqueous solution, however, is easier to prepare and obviates the difficulty encountered as the result of the polymerization of aldehydes in alcohol. The aqueous standard appears to remain unchanged almost indefinitely in the refrigerator. Secondary standard solutions were ether solutions of acetaldehyde. They were prepared by diluting some of the primary standard with aldehyde-free dry ether. The ether was dried by shaking for a few minutes with a few pieces of calcium chloride. Shaking for a few minutes sufficed to dissolve the primary standard. The usual secondary standard was made by diluting 1 cc. of the primary standard to 100 cc. with the aldehyde-free dry ether, making 100 parts per million of acetaldehyde. In some instances this was further diluted as much as four times (25 parts per million) for colorimetric readings in order to bring the standard as close to the test sample as possible. The comparisons of the standard with the test solutions were made in a colorimeter rather than by a direct inspection in test tubes as in the method of Cary, Green and Schoetzow.[12] For this purpose the following mixtures were prepared simultaneously: a 5 cc. sample of secondary standard acetaldehyde in ether and 5 cc. of Schiff's reagent, and a 5 cc. sample of ether and 5 cc. of Schiff's reagent. Each mixture was placed in a 50 cc. glass-stoppered flask and agitated with a swirling motion for twelve minutes. The ether was carefully decanted and the two specimens of 5 cc. of reagent containing all the developed color were immediately compared in a colorimeter. The color development in Schiff's reagent with aldehydes is not strictly proportional to the concentration. Data relating color depth to concentration of aldehyde have been published by Bonis,[13] from which a calibration curve was prepared and used for making the necessary minor corrections in the figures obtained by direct colorimeter readings.

Acids: Five cc. of 95 per cent alcohol was placed in a 50 cc. glass-stoppered flask. To this was added 2 drops of bromthymol blue and enough 0.01 molar sodium hydroxide [14] to produce a neutral green color. Then 25 cc. of the ether sample was added, the flask was stoppered, and after thorough shaking the mixture was

TABLE 3.—*Types of Operations in the Cases in Which a Mixture of Anesthetic Agents Was Used*

Operation	U. S. P. XI Drum Ether	Small Can Ether U. S. P. XI Labeled "For Anesthesia"
1. Appendectomy	148	110
2. Biliary tract	56	42
3. Major gynecologic	45	23
4. Prostate and bladder	12	10
5. Kidney and ureter	16	12
6. Stomach	20	15
7. Intestinal resection	20	8
8. Nose and throat (tonsils, adenoids, antrums, etc.)	143	149
9. Thyroid	22	18
10. Exploratory laparotomy	17	14
11. Radical breast	17	12
12. Hemorrhoidectomy	7	21
13. Hernia	42	30
14. Closed and open reduction	26	11
15. Incision and drainage	44	46
15. Miscellaneous	156	110

TABLE 4.—*Types of Operations in the Cases in Which Ether Was the Sole Anesthetic Agent*

Operation	U. S. P. XI Drum Ether	Small Can Ether U. S. P. XI Labeled "For Anesthesia"
Tonsillectomy	100	99
Appendectomy	19	10
Circumcision	33	13
Closed reduction	3	3
Open reduction	2	2
Incision and drainage of abscess	8	9
Mastoidectomy	15	10
Cholecystectomy	4	0
Exploratory laparotomy	0	1
Dilation of rectal sphincter	1	0
Oöcotomy	2	6
Prostatectomy	1	0
Ventriculogram	3	5
Hernia	5	4
Adenoidectomy	6	2
Cystoscopy	2	3
Craniotomy	2	2
Splenectomy	1	0
Miscellaneous	39	26

TABLE 5.—*Distribution of Cases of Vomiting During the Induction and Maintenance Stages of Anesthesia*

Type of Anesthesia	Number of Cases
All anesthesias	79
Mixed anesthesias	56
Small can ether U. S. P. XI (mixed anesthesia)	30
Drum ether U. S. P. XI (mixed anesthesia)	26
Small can ether U. S. P. XI alone	11
Drum ether U. S. P. XI alone	12

11. Wenger, P.; Cimerman, C., and Rzymowska, C. J.: Contribution à l'étude microanalytique du potassium, Mikrochemie **20**: 1, 1936.
12. Carey, M. W.; Green, L. W., and Schoetzow, R. E.: A Method for the Determination of Minute Amounts of Aldehydes in Ether, J. Am. Pharm. A. **22**: 1237 (Dec.) 1933.
13. Bonis, M. A.: Méthodes officielles pour l'analyse des denrées alimentaires, Annales Falsif. **2** (appendix): 13, 1909.
14. The solution of sodium hydroxide was originally made up as 0.01 molar. It was titrated against 0.01 molar hydrochloric acid every week, and the change in molarity of sodium hydroxide was taken into account in the calculation.

titrated with 0.01 molar sodium hydroxide to the appearance of a blue color. The amount of acid in the ether was then calculated as acetic acid.

2. *Kinds of Ether and Methods of Storage.*—Two types of ether were employed in these experiments: 1. Ether U. S. P. XI labeled "for anesthesia" (Mallinckrodt, Squibb, Merck) was obtained in the 1 to 5 pound tins in which it is supplied on the market. The metal caps were removed and the cans were stoppered with ordinary cork. 2. U. S. P. XI ether was obtained in bulk in a 27 pound drum (Mallinckrodt).

These ethers were tested when first opened and then they were divided into groups and stored in various ways in order to study the effect of the following factors on deterioration:

1. Effect of temperature (cans in refrigerator and at room temperature).

2. Effect of cork (1 Gm. of ground cork introduced into the ether can).

3. Effect of access of air (can stoppered so lightly—only by force of the weight of the cork—that evaporation of the ether took place fairly rapidly).

4. Effect of repeated opening and cork stoppering of the container.

5. Effect of clear and amber colored bottles (stored in dark laboratory closet).

6. Effect of daylight (stored in clear and amber colored bottles on a laboratory shelf).

7. Effect of bright sunlight (stored in clear and amber colored bottles on window sill exposed directly to bright sunlight).

TABLE 6.—*Postoperative Complications in Patients Anesthetized* with U. S. P. XI Drum Ether and U. S. P. XI Small Can Ether Labeled "For Anesthesia"*

Complications	U. S. P. XI Drum Ether	U. S. P. XI Small Can Ether Labeled "For Anesthesia"
Total number of postoperative pulmonary complications	18	24
Total number of deaths	12	13
Causes of death	1. Shock following lobectomy 2. Shock and internal hemorrhage 3. Internal hemorrhage 4. Peritonitis and shock 5. Peritonitis 6. Peritonitis 7. Peritonitis 8. Pulmonary embolus 9. Pulmonary embolus 10. Pulmonary embolus 11. Pneumonia 12. Carcinomatosis	1. Pulmonary emboli and peritonitis 2. Peritonitis and pneumonia 3. Purulent meningitis 4. Peritonitis and uremia 5. Hemorrhage 6. Heart failure 7. Heart failure; hemophilia 8. Peritonitis and hemorrhage 9. Carcinomatosis 10. Intestinal gangrene 11. Intestinal hemorrhage 12. Bronchopneumonia; nephrosis 13. Peritonitis and bronchopneumonia
Nature of nonfatal pulmonary complications	1. Bronchitis with partial atelectasis 2. Bronchiectasis ? 3. Pulmonary edema 4. Pulmonary edema 5. Atelectasis 6. Atelectasis	1. Bronchopneumonia 2. Bronchopneumonia 3. Bronchopneumonia 4. Bronchopneumonia 5. Pneumonia 6. Pneumonia 7. Pneumonia 8. Pneumonia 9. Bronchitis 10. Bronchitis 11. Pulmonary infarct

* In some cases only ether was used; in others, mixed anesthetic agents.

3. *Results of Chemical Tests for Deterioration.*—The accompanying charts show the type of curves obtained when ether is stored under unfavorable conditions which promote deterioration.

The essential details of the chemical results with all the specimens are presented in tables 1 and 2. Sunlight is unfavorable to the preservation of ether. When ether was exposed to bright sunlight in an amber bottle traces of impurities appeared on the second day, but the increase was fairly slow so that the ether was negative by U. S. P. XI qualitative tests for purity for more than two weeks. In the clear bottle, however, the formation of impurities was very much more rapid, the ether becoming positive for impurities by the U. S. P. XI tests by the second day. All the ether stored in bottles in the warm room developed impurities, but in the absence of light the deterioration was very much slower than is commonly supposed. In a dark closet a week passed before even traces of impurities appeared; in one case (clear glass) it was about three weeks before the ether was unfit by the U. S. P. XI tests, and in another case (amber glass) the impurities never became positive by the U. S. P. XI tests even after sixty-three days of such storage.

Bulk ether U. S. P. XI (Mallinckrodt) in a 27 pound drum which was opened and stoppered repeatedly failed to develop any impurities in the course of sixty-four days.

Among twelve specimens of ether U. S. P. XI labeled "for anesthesia," stored in the cans in which they were obtained, ten developed no impurities in from forty-one to seventy-five days. The other two showed only about one tenth of the amount of aldehyde detectable by the very delicate U. S. P. XI tests for impurities after storage for fourteen and forty-nine days respectively.

TABLE 7.—*Comparison of Incidence of Satisfactory and Unsatisfactory Anesthesias in Cases in Which U. S. P. XI Drum Ether Was Used with That in Cases in Which Small Can Ether U. S. P. XI Labeled "For Anesthesia" Was Used*

	U. S. P. XI Drum Ether		Small Can Ether U. S. P. XI Labeled "For Anesthesia"	
	Number	Per Cent	Number	Per Cent
Ether alone (446 cases)				
Total cases	249	....	197	....
Satisfactory	212	85.1	163	82.8
Unsatisfactory	37	14.9	34	17.2
Mixed anesthesia (1,419 cases)				
Total cases	781	....	638	....
Satisfactory	673	86.2	558	87.5
Unsatisfactory	108	13.8	80	12.5
All anesthesia (1,865 cases)				
Total cases	1,030	....	835	....
Satisfactory	885	85.9	721	86.3
Unsatisfactory	145	14.2	114	13.7

All cans were opened many times for the removal of samples and again stoppered with cork. The ether in anesthetic ether cans failed to develop significant impurities whether the ether was stored in the refrigerator or at room temperature. Ground cork in the ether can did not promote deterioration after storage for fifty days. The ether in the can which was very lightly stoppered evaporated in about two weeks, but no significant deterioration was present as long as the ether lasted.

CLINICAL STUDY

Methods.—We have already referred to the clinical study by Hediger and Gold [2] in 1935. The reason for that investigation was the prevalence of a notion that some change may take place in ether, not detectable chemically, which may render it unfit for anesthesia. The clinical study was carried out with the "blind test," a simple expedient which insures a record free of the influence of subconscious bias. This technic is especially necessary in the case of a clinical study on ether, in view of the strong devotion of anesthetists to one or another of the favored brands of anesthetic ether. Ether was supplied to the operating room in small cans stoppered with cork, numbered consecutively and bearing a uniform label. A detailed record on a special chart was made by the anesthetist. This included an account of those factors with respect to which the different kinds of ether were to be compared: coughing, excessive mucus, undue struggling, vomiting, cyanosis, signs of collapse, unduly prolonged induction stage, difficulty in obtaining sufficient anesthesia or relaxation, and postoperative complications. Criteria were formulated by means of which the anesthesias were also labeled "satisfactory" or "unsatisfactory." These designations expressed a judgment on the part of the anesthetist concerning factors which might reasonably influence the character of the anesthesia, such as the temperament of the patient, the character of the operation and the type of preliminary medication. This record, except for the postoperative complications, was made by the anesthetist at the time of the operation and in all cases without knowledge of the identity of the specimen. The source of the ether remained unknown also to those who analyzed the results until the analyses were completed and the results recorded. In that study on 702 surgical anesthesias it was shown that anesthetists could not distinguish between the anesthesias with ether taken from one-fourth pound freshly opened tins and those with ether taken from a large drum which had been opened repeatedly, both types of ether, of course, being chemically pure.

The clinical study has now been extended to include nearly 2,000 additional surgical anesthesias. The results are presented in tables 3 to 7. The ether in small sealed tins was that of Squibb, Merck and Mallinckrodt. The bulk ether was obtained from Mallinckrodt in 27 pound drums. A large number of small emptied ether cans labeled "for anesthesia" of the type in which anesthetic ether is supplied by Squibb, Merck and Mallinckrodt were assembled. These were rinsed with bulk ether and then filled with bulk ether, stoppered with cork and supplied on demand to the operating room.

Results of Clinical Comparison.—The same general types of operations were represented in the two groups (tables 3 and 4). The cases of vomiting during induction and maintenance were essentially similar in distribution (table 5) with the two kinds of ether. The postoperative pulmonary complications were also similar with the two types of ether (table 6). In table 7 it may be seen that among 1,030 anesthesias with bulk ether 85.8 per cent were satisfactory, and among 835 anesthesias with ether from small cans 86.3 per cent were satisfactory.

These results, therefore, confirm our previous observations, showing that ether in bulk from a metal container which has been opened many times and stoppered with cork remains chemically pure over periods of many weeks and produces anesthesia that is in no way distinguishable from that with ether from a small sealed metal container.

COMMENT

In the present study we have secured data concerning the speed of deterioration of ether under unfavorable circumstances and concerning its behavior under favorable conditions. Ether does not deteriorate nearly as quickly as is commonly supposed. If the sealed metal container in which anesthetic ether is supplied is opened and the container stoppered with cork repeatedly, the ether remains pure for many weeks. Since there is always the possibility that some of the cork may drop into the ether, we tested the effect of cork in ether and found that ordinary laboratory cork has no appreciable influence on the speed of deterioration of ether. In view also of the fact that a can might accidentally be left lightly stoppered and the access of air in that way accelerate deterioration, we investigated that matter also and found that under those conditions the ether evaporates but remains pure to the last drop (at least two weeks).

In a study of nearly 2,000 surgical anesthesias in which ether was employed, we have found that the ether taken from these cork-stoppered anesthetic ether cans is indistinguishable clinically from ether in the sealed metal containers.

In our experience with this matter we have learned that it is extremely difficult to avoid the confusion of issues. Although we believe that the supposed danger of traces of impurities in ether is not based on sound evidence, we wish to emphasize that we do not recommend the use of impure ether. We have simply shown that, when pure anesthetic ether is kept in an anesthetic ether can which is opened and stoppered with cork repeatedly, the ether remains pure. It appears to be the experience of ether manufacturers that the behavior of ether is capricious and that for reasons which they cannot discover ether will sometimes undergo deterioration inside the sealed metal containers. There is no reason for believing that the caprice of ether with regard to deterioration in this way is influenced by opening the sealed container and stoppering it with cork.

CONCLUSIONS

In view of the foregoing facts we reaffirm the conclusions reached in our previous studies. Hospitals may use ether in bulk for anesthetic purposes. This ether can be transferred from a 25 pound drum, either directly by a funnel or by a copper siphon arrangement, to small emptied anesthetic cans which can then be stoppered with cork. Such ether in a drum can be kept for at least a month without developing impurities. Where less ether is used, the small quarter pound tins can be filled from 5 pound cans instead of 25 pound drums. A considerable saving in the cost of ether to the hospital can be effected in that way. Some outstanding hospitals in the United States are now using such bulk ether for surgical anesthesia. This practice involves no compromise with the purity of the ether or the safety of the patient.

1300 York Avenue.

Prophylaxis of Cholera.—Prevention of cholera may be divided into three subsections: (*a*) the use of vaccines; (*b*) the use of bacteriophage; (*c*) general methods including quarantine measures.—Scott, H. Harold: A History of Tropical Medicine, Baltimore, Williams & Wilkins Company, 1939.

SOME SPECIFIC MEASURES IN THE TREATMENT OF RHEUMATOID ARTHRITIS

H. M. MARGOLIS, M.D.
AND
V. W. EISENSTEIN, M.D.
PITTSBURGH

Within the past decade serious investigators of arthritis have been unanimous in emphasizing the fact that the foundation for the successful management of chronic arthritis, like that for tuberculosis, is a broad and comprehensive program of treatment. Many allied therapeutic measures, headed by the judicious application of rest, are required. From time to time, nevertheless, newer modes of therapy are brought forth; they have their ardent exponents and, later, equally earnest and capable antagonists, and for varying periods each enjoys a vogue as a possible "specific" treatment for rheumatoid arthritis.

These measures have in the main been difficult to evaluate. One reason for this difficulty is the lack of control studies by those initiating a new form of treatment in arthritis. The fact that rheumatoid arthritis may be a self-limited disease, certainly one subject to spontaneous remissions, further complicates any individual physician's efforts to achieve balanced judgment with regard to the use of new drugs. On the contrary, disappointment with a new measure may engender distrust of all therapeutic efforts.

But newer measures of treatment in rheumatoid arthritis continue to enjoy increasing application, once they have gained the momentum of active use. More often than not they are kept alive by intensive campaigns of advertising emanating from commercial pharmaceutic houses. Often glowing results of the use of these new measures are quoted out of their context. The "blurbs," so to speak, focus on the drug, not on the drug in relation to the entire medical regimen employed. For all these reasons the general practitioner, particularly, has found himself at a disadvantage in choosing those resources most likely to be of value.

Among such therapeutic measures the effectiveness of which, we feel, requires evaluation at this time are colloidal sulfur, vaccines, sulfanilamide, fever-inducing machines and, of more recent vintage, gold salts.

In order to consolidate the experience with these forms of treatment a questionnaire was sent to the 178 members of the American Rheumatism Association, comprising physicians all over the United States particularly interested in rheumatic disease. Doubtless this cumulative experience constitutes an excellent cross section of clinical trial and serves as a touchstone to our own clinical experience.

One hundred and eleven replies to the questionnaire were received; ninety-two answered in considerable detail regarding the value of these therapeutic measures. This group includes physicians or clinics who treated 200 or more patients with any given modality, as well as those who treated only a few patients and thereby gained some clinical impressions as a guide. The other nineteen who replied stated that they could not furnish the data requested, either because they had not sufficient clinical experience, being interested only academically in the problem of arthritic disease, or because they were affiliated in the management of the same group of patients concerning whom their associates reported to us.

For the purpose of the present note, detailed statistical analysis of the data is neither feasible nor desirable. In general, the answers regarding the value of any given measure ranged preponderantly "for" or "against." We feel that the material here collected is a good indicator of the present status of each mode of therapy to be discussed. It may well serve as a guide to the perplexed physician who seeks unbiased knowledge on the value of certain specific forms of treatment he would like to include in his armamentarium.

COLLOIDAL SULFUR

A purely empiric notion led originally to the trial of sulfur in the treatment of arthritis. The experience with it has been extensive and the views of various observers who have reported on its value have been extremely contradictory. A review of the literature is unnecessary here, because it is available in a report of the Council on Pharmacy and Chemistry of the American Medical Association.[1] This report constitutes a thorough, unbiased and critical evaluation of the many isolated reports on the subject.

In 1937 one of us (H. M. M.) stated that sulfur injections proved entirely ineffective in our experience.[2] And the answers to our questionnaire essentially parallel and substantiate the former conclusion. For, as the summary of the data from the questionnaires indicates, more physicians who had given sulfur a trial have abandoned its use than are continuing it (thirty-six to twenty-two). The more extensive the trial, the fewer the favorable impressions of its use. Moderate users, who constitute the majority of reporters, found it "of no benefit" in arthritis, and (in a ratio of seven to one) report it "disappointing," "overrated" or "of no use." The dosage employed by both those who continued and those who discontinued its use was essentially the same. The occasional favorable reports appeared to be more enthusiastic than critical.

It is also significant, as the report of the Council on Pharmacy and Chemistry brought out, that none of the leading arthritis clinics which have given sulfur therapy a trial are continuing its use; all have abandoned it.

Most illuminating are the detailed metabolic studies of Freyberg and his associates,[3] which emphasize the total lack of rationale in the therapeutic use of sulfur. Studying a group of patients with rheumatoid arthritis they could find no deviation from normal in the metabolism of sulfur. They showed that the concentration of sulfur in the blood of rheumatoid arthritic patients is essentially the same as in normal controls. They demonstrated further that, if a deficiency of sulfur exists in the tissues, this deficiency cannot be remedied by administration of sulfur, since the drug is too rapidly and almost quantitatively excreted after parenteral injection or when given by mouth.

How, then, explain the favorable therapeutic results reported by some observers? Improvement following administration of sulfur may likely have been a coin-

1. Colloidal Sulfur in the Treatment of Chronic Arthritis, Report of the Council on Pharmacy and Chemistry, J. A. M. A. 111:1657 (Oct. 29) 1938.
2. Margolis, H. M.: The Treatment of Atrophic Arthritis, in Clinical Reviews of the Pittsburgh Diagnostic Clinic, New York, Paul B. Hoeber, Inc., 1937, p. 255.
3. Freyberg, R. H.; Block, W. D., and Fromer, M. F.: Sulfur Metabolism and the Effect of Sulfur Administration in Rheumatoid Arthritis, J. A. M. A. 113:1063 (Sept. 9) 1939.

cidence and not attributable to the drug. There is no questioning the psychologic effect of an injection—of any type of injection—on patients with arthritis. The beneficial effect that is ascribed to sulfur is probably to be attributed either to a favorable psychogenic influence of the injections or to the well known tendency to spontaneous temporary remission in the severity of arthritic manifestations.

VACCINE THERAPY

Various reports in medical literature can easily be assembled to support a brief either for or against the value of vaccine therapy in atrophic arthritis. The very number of vaccines for rheumatoid arthritis so highly lauded by their individual sponsors should be sufficient proof, however, that none are specific.

Despite an extensive experience with vaccines, Stainsby and Nicholls [4] were thoroughly disappointed in their results. Jordan [5] emphasized the need for controlled investigation. He deprecated the routine use of vaccine with the "implication of certain cure." Only recently, the first controlled study on the value of vaccines and injections in the treatment of arthritis was presented by Sidel and Abrams,[6] who found that, while vaccine therapy is "beneficial" in 68 per cent of cases, sterile saline solution, similarly injected, is equally "beneficial" in 72 per cent.

Our own observations indicate that the promiscuous injection of vaccine in atrophic arthritis has probably caused more harm than good. There is little exact knowledge of how vaccines act in these cases. The experimental facts on which the various forms of vaccine therapy are based cannot be applied, in toto, clinically. Nothing could be more convincing of how sadly we are lacking in knowledge concerning the type and manner of vaccine therapy than the extremely conflicting practices that have been advocated by various writers. "There are investigators who report a large percentage of cures by giving millions of streptococci intravenously. Others, equally sincere, report similar results when the equivalent of less than one organism is used. There are ardent advocates of subcutaneous and of the intravenous method of inoculation. Stock vaccines are championed by some and decried by others. Agglutination, complement fixation and skin reactibility have all been defined as guides to diagnosis and therapy. Constitutional reactions are believed to be desirable or harmful, depending on the investigator."

From time to time we have studied various methods of vaccine therapy. Undoubted clinical improvement, attributable primarily to vaccine, is rarely observed. We have seen some unfavorable reactions. It is conceivable that a patient highly sensitive to streptococci can be made worse by subcutaneous injection of large doses of vaccine. Also sensitization may possibly be created or increased by long continued administration of vaccine into the skin. Acutely ill patients are least likely to tolerate vaccine therapy. And, if their general resistance is low, a stubborn bombardment with vaccines may place them in serious jeopardy.

4. Stainsby, W. J., and Nicholls, E. E.: Results of Treatment in Rheumatoid Arthritis, with Reference to Foci of Infection and Streptococcus Vaccine, J. Lab. & Clin. Med. **18**: 881 (June) 1933.

5. Jordan, E. P.: Critical Evaluation of Vaccine Therapy in Rheumatism, J. A. M. A. **109**: 1444 (Oct. 30) 1937.

6. Sidel, Nathan, and Abrams, M. I.: Treatment of Chronic Arthritis: Results with Saline Injections Used as Controls for Vaccine Therapy, read before the sixth annual meeting of the American Rheumatism Association, St. Louis, May 15, 1939, to be published.

In the light of these facts let us analyze the clinical impressions of the value of vaccines in rheumatoid arthritis, elicited by our questionnaire:

Fifty-nine physicians stated that they used vaccines; twenty-four did not; eight used them only rarely; fourteen had abandoned their use. Many definitely stated that they employed vaccines much less frequently now than before. About 60 per cent of users believe vaccines are beneficial to a degree. The consensus, however, indicated that fewer than 50 per cent of patients derived benefit from their use, these being particularly in the early stage. The extent of usage varies considerably, from some clinics where most atrophic patients are vaccine treated, to others where only the "get nowhere" patients are so treated. Most popular are the streptococcus vaccines (used by fifty physicians), next the autogenous (forty-one). Most workers emphasize the desirability of avoiding reactions. Of those who had not found vaccines of any benefit, most had given them extensive trial, had employed predominantly the streptococcic variety, and attributed whatever benefit was ascribed to vaccines by others largely to a psychogenic influence.

Our own experience with various types of vaccines long ago impressed us with the conclusion that, in the occasional case in which some benefit is apparently derived, it is largely attributable to a purely psychic effect. Having concluded that vaccines do not fundamentally alter the course of the disease, we have entirely abandoned their use in arthritis. The impression gained from the questionnaire, as well as the results of Sidel and Abrams, reassure us that we have sacrificed very little.

Surely vaccine therapy is anything but a panacea. Its effect is not specific and its value is quite limited. It may impress the patient that something tangible and specific is being done, but that is not true. It gives him a false sense of security on which he may rely too much. If the periodic injection of vaccine is condoned on the score that it affords the physician an opportunity of seeing his patients often and for long periods and thus permits the application of other, important, therapeutic measures, it would be well, then, that the physician consciously recognize this fact. But too often the injection of vaccine becomes a fetish for the physician as well as the patient, and other measures are then altogether neglected.

FEVER THERAPY

When physical means became available for the administration of fever therapy, it was hoped that fever-inducing machines might be applicable in the treatment of rheumatoid arthritis. Extensive trial of this form of treatment was therefore carried out. Estimates of its effectiveness in atrophic arthritis have varied, depending to an extent on the enthusiasm of the observer. In general, the experience of others with this type of therapy has paralleled our own.

In 1932 in the treatment of thirteen patients with rheumatoid arthritis we employed hyperthermia induced by a high frequency current. Elevations of temperature to from 103 to 104 F. were induced and maintained for periods of four to six hours, a series of four to six such treatments being given at weekly intervals. Seeking an opportunity for demonstrating the maximum benefit available from fever therapy, we selected patients with the disease of relatively short duration, with pathologic changes confined largely to periarticular structures and, generally, with minimal degrees of bony change or deformity.

The initial improvement that generally occurred immediately after a treatment was often remarkable. Stiffness and soreness generally disappeared; the pain was abated, and frequently periarticular swelling disappeared completely. Naturally, greater freedom of motion and an increased sense of well-being resulted. It was disappointing, however, that those gains were only temporary. Frequently within forty-eight hours, but practically always within a week, the condition of the joints resumed the status preceding the fever therapy session. All of the previous symptoms returned. Such improvement in and recurrence of symptoms followed each session of fever therapy. We were equally disappointed not to find any cumulative beneficial action from the series of treatments administered. Observing these patients for months afterward, we were forced to conclude that there was nothing to recommend this form of treatment for rheumatoid arthritis.

Shortly afterward, Nicholls, Hansson and Stainsby [7] reported their results on the treatment of rheumatoid arthritis with hyperthermia. With twelve patients so treated their results coincided with ours in every respect. They too observed temporary relief of symptoms but not lasting benefit. They emphasized the fact that this form of therapy entails not only a trying ordeal for the patient but also some risk of complications. They concluded that their results did not justify continuing the employment of fever therapy in rheumatoid arthritis. Recently Krusen and Elkins [8] indicated that 70 per cent of patients with infectious (rheumatoid) arthritis treated by fever therapy exhibited little or no improvement. For the 30 per cent who were improved, the therapeutic program included, besides fever therapy, a well rounded medical regimen. The evidence in favor of fever therapy alone in this condition is obviously wanting.

The results reported through our questionnaire confirm the impressions just described. Thus of ninety-two physicians reporting, 57 use, or have used, fever therapy as a modality in the treatment of rheumatoid arthritis. Good results were reported by very few; poor results were preponderant in the ratio of two to one. Reiterated in the replies were the dangers of fever therapy for all but the most robust patients. Two fatalities and two near fatalities were encountered. The next most frequent comment was the fact that whatever benefit results from fever therapy is only temporary, relapses usually occurring. The latter was the most frequent reason given for abandoning this type of treatment. The occasional good results reported have been those among young subjects with early atrophic arthritis or among those suffering from gonorrheal arthritis.

These answers indicate that fever therapy is not for the general run of arthritic patients. At present this measure holds little promise of benefit for the patient with rheumatoid arthritis. A combination of induced fever and some form of chemotherapy may possibly yield more worth while results in the future.

SULFANILAMIDE

In view of the possibility that a hemolytic streptococcus infection is related to rheumatoid arthritis, it seemed logical to try the effect of sulfanilamide in this condition. We administered this drug in adequate doses to a small group of patients with active rheumatoid arthritis. The results were entirely disappointing. Not only were beneficial effects not noted but the reactions from the drug were for the most part disturbing, if not serious. The use of sulfanilamide in rheumatoid arthritis was therefore discontinued. Reports of other observers confirm the impression we had gained. Swift, Moen and Hirst,[9] for example, found sulfanilamide valueless in the treatment of rheumatic fever, and Coggeshall and Bauer,[10] treating ten patients with rheumatoid arthritis with large doses of sulfanilamide, could find no beneficial effect either on the clinical course of the disease or on the sedimentation rate. This contrasted with the beneficial effects observed in the treatment of gonorrheal arthritis, in which there were both clinical improvement and reduction of the rate of sedimentation.

Sulfanilamide was tried by forty-four of the ninety-two physicians who answered our questionnaire. The opinions were practically unanimous in condemning this drug for the treatment of atrophic arthritis. It is clear that with present methods of administration sulfanilamide has no therapeutic value in this disease.

GOLD SALTS

Gold salts, first recommended for use in arthritis by Forrestier, in France, have been employed rather widely in England also and to a lesser extent in this country. Its mode of action in arthritis is unknown. It is certainly not a cure-all. Its use is sometimes attended by moderate, even serious, reactions. But the possible importance of gold therapy in the therapeutic armamentarium for this difficult disease is enthusiastically attested by those with large experience in its use, even those who are most critical in evaluating their results. As Hench and his associates [11] have pointed out: "The curve of acceptance of most 'new' treatments for arthritis that are destined to be discarded rises rather rapidly, reaches its peak in about three to five years, then falls as adverse reports begin to outnumber the optimistic ones. Finally, use of the treatment in any significant degree dies out after about eight to ten years. . . . It therefore seems significant that the curve of acceptance of chrysotherapy is still rising after ten years of use." In Europe, where the treatment of rheumatoid arthritis with gold salts is receiving its most extensive trial, under the auspices of critical observers, the impression is gaining ground that this drug represents a distinct advance in treatment.

There are, however, serious obstacles at present to its widespread use, the most important obstacle being the toxicity of gold compounds. We feel, nevertheless, that the subject of chrysotherapy deserves consideration at this time. This topic, which has received such merited comment in the European literature, has also been accorded favorable attention in recent American publications.[12] If our impression is correct, chrysotherapy will

7. Nicholls, E. F.; Hansson, K. G., and Stainsby, W. J.: Treatment of Rheumatoid Arthritis with Hyperthermia Produced by a High Frequency Current, J. Bone & Joint Surg. **10**: 69 (Jan.) 1934.

8. Krusen, F. H., and Elkins, E. C.: Fever Therapy by Physical Means, J. A. M. A. **112**: 1689 (April 29) 1939.

9. Swift, H. F.; Moen, J. K., and Hirst, G. K.: The Action of Sulfanilamide in Rheumatic Fever, J. A. M. A. **110**: 426 (Feb. 5) 1938.

10. Coggeshall, H. C., and Bauer, Walter: The Treatment of Gonorrheal and Rheumatoid Arthritis with Sulfanilamide, New England J. Med. **220**: 85 (Jan. 19) 1939.

11. Hench, P. S.; Bauer, Walter; Dawson, M. H.; Hall, Francis; Holbrook, W. P., and Key, J. A.: The Problem of Rheumatism and Arthritis: Review of American and English Literature for 1937, Ann. Int. Med. **12**: 1005 (Jan.) 1939.

12. Key, J. A.; Rosenfeld, Herman, and Tjoflat, O. E.: Gold Therapy in Proliferative (Especially Atrophic) Arthritis, J. Bone & Joint Surg. **21**: 339 (April) 1939. Snyder, R. G.; Traeger, C. H., and Kelly, L. Morne: Gold Therapy in Arthritis: Observations on 100 Cases Treated with Gold Sodium Thiosulphate and Aurocein, Ann. Int. Med. **12**: 1672 (April) 1939.

be discussed more prominently in the future. The virtues of chrysotherapy are also due to be aired soon through pharmaceutic notices. In one way or another the physician will be seriously tempted to adopt this "newer," promising way of treating arthritis. In order that he may not plunge carelessly and indiscriminately into employment of chrysotherapy, the following account of some present day knowledge on the subject is thought to be in order:

The most comprehensive study of every phase of chrysotherapy in arthritis, including its toxic reactions, is that of Hartfall, Garland and Goldie,[13] who reviewed their results of treatment in 900 cases. No one who attempts to treat rheumatoid arthritis with gold compounds should fail to review this report with the greatest care.

In any consideration of gold therapy, serious thought must be given to the danger of toxic reactions, which constitutes the most serious obstacle to the widespread adoption of this promising therapeutic measure. The therapeutic use of gold compounds is occasionally attended by serious complications such as liver and renal damage, certain blood dyscrasias and dermatitis, some of which end fatally. Unfortunately, we have no way at present of determining which individuals are hypersensitive to the drug. Patients with such an idiosyncrasy to gold may contract a serious reaction after receiving the very first dose, regardless of its size. Yet these toxic reactions are not entirely unavoidable; to an extent, at least, the frequency of serious reactions may be greatly reduced. It appears that, by carefully modifying dosage and the method of administration, the mortality from toxic reactions of gold can be reduced. The fact remains, however, that any drug, no matter how useful but potentially capable of inducing fatal reactions, must be employed with the utmost reserve.

Aside from the fatal reactions induced by gold compounds, other toxic manifestations, appearing in a great variety of forms, develop not infrequently. In the series of 900 cases reported by Hartfall, toxic phenomena of greater or lesser severity were exhibited by 42 per cent of the cases, and in 35 per cent of these the reactions were more than trivial.

A variety of preparations of gold have been employed. In this country gold sodium thiosulfate and aurothiomalate of sodium have been the preparations most readily available and most commonly used. In our earlier experience we employed gold sodium thiosulfate intravenously. During the past two years we have employed aurothiomalate of sodium by intramuscular injection.

When the published results of gold therapy are analyzed, it becomes apparent that this is one of the most satisfactory adjuncts in the treatment of arthritis yet devised. Ninety-four per cent of Copeman and Tegner's[14] series showed a favorable response to treatment. In Hartfall's[13] series of 900 cases 67 per cent of the patients with rheumatoid arthritis who were able to complete the prescribed course of treatment were markedly improved or "cured" and a further 19 per cent showed some improvement, a total of 86 per cent. These clinicians "firmly believe that rheumatoid arthritis, if seen in its early stages, can be cured by gold, and that there are few, if any, cases of the disease that cannot be improved to some extent."

Only twenty-six of ninety-two physicians who answered our questionnaire had used gold salts in the past or are using them at present. Most of these men are fearful of their use. They report reactions with approximately the same frequency as was reported from Europe: 10 per cent mildly toxic reactions, 25 per cent moderately severe reactions, 0.8 per cent fatalities. Of this group of twenty-six American physicians reporting on gold salts only one reported a fatality, that from aplastic anemia. The hazard of toxic reactions from gold is implied, however, in the terse summary of one clinician: "used it once; never again." Most present users—and these have used it in from twenty-five to 200 cases—are enthusiastic, believing gold salts to be "the best single therapeutic measure to date" in the treatment of atrophic arthritis as measured both by clinical improvement and by definite decrease in the sedimentation rate. The consensus, however, seems to be that the results obtained from the use of gold salts to date are not sufficient to justify the risk involved.

Our own results with gold therapy in fifty-one cases of rheumatoid arthritis have in general been very satisfactory. The series is too small for detailed analysis of the degree of improvement. Nor were these patients treated with gold alone. Yet it is our present impression that chrysotherapy contributed to inactivating the arthritis more often, more decisively and more promptly than any other adjuvant measure of therapy we had previously employed.

Although we feel that gold salts represent a most useful adjunct in the treatment of atrophic arthritis, there are good reasons for not recommending their more general adoption at this time. We feel that the potentialities for serious harm must be considered. Patients presenting the slightest evidence of renal or hepatic insufficiency or a tendency to purpura or leukopenia should be rigorously excluded from chrysotherapy. Nor should the drug be employed for patients who have chronic cutaneous disorders, particularly eczema. It is, moreover, too early to appraise the definitive place of gold therapy in rheumatoid arthritis. Undoubtedly the practitioner who is impressed with the glowing reports on the value of gold therapy to the point of substituting it for a vaccine or sulfur preparation as a specific for arthritis has pitfalls before him. It would be well to remember that in using this modality one assumes the serious responsibility that goes with the use of a potentially dangerous drug. Moreover, whatever virtue chrysotherapy may have will surely be lost if it is not realized that this drug, like any other single measure of treatment in arthritis, is only a single link in a chain of therapeutic endeavors.

SUMMARY AND CONCLUSIONS

The cross section of actual medical practice as it relates to certain specific therapeutic measures in arthritis, based chiefly on a questionnaire survey and supported by our own experience, justifies the following conclusions:

1. Sulfur therapy is both without rationale and without effect.

2. Vaccines are apparently losing hold. Although their employment results in "benefit" in a proportion of cases, such results are attributable not to any specific effect of the vaccine but apparently to the psychologic effect of the injection.

13. Hartfall, S. J.; Garland, H. G., and Goldie, William: Gold Treatment of Arthritis: A Review of 900 Cases, Lancet 2:784 (Oct. 2) 1937.
14. Copeman, W. S. C., and Tegner, W.: A Review of Gold Therapy, Lancet 1:554 (March 6) 1937.

3. It is the practically unanimous opinion from all over the country that the therapeutic results from fever therapy are only transitory, and even these are obtained in such a small proportion of cases treated that this form of therapy cannot assume any place of importance. The risks involved, as well as the technical difficulties entailed, far outweigh any modicum of benefit that might be expected.

4. Sulfanilamide is unanimously condemned for use in rheumatoid arthritis.

5. Gold salts offer a promising, but at present dangerous, adjunct to the armamentarium of the practitioner.

6. There is no royal road to the successful treatment of arthritis. A well rounded medical management, tempered with sound clinical judgment, must still prevail as the best therapeutic regimen.

423 Jenkins Building.

MERCURY BICHLORIDE POISONING TREATED WITH SODIUM FORMALDEHYDE SULFOXYLATE

RESULTS IN FORTY CASES

LOUIS A. MONTE, M.D.
AND
EDGAR HULL, M.D.
NEW ORLEANS

In 1934 Rosenthal [1] recommended sodium formaldehyde sulfoxylate as an antidote in acute mercury poisoning and at the same time reported ten cases in which it had been used without a fatality. Later in the same year we [2] reported seven cases in which this new antidote had been used, with, however, three deaths. Since that date we have observed the use of sodium formaldehyde sulfoxylate in an additional thirty-three cases of mercury bichloride ingestion, and the combined forty cases form the basis of this report. We make this contribution solely for the purpose of adding to the literature a representative number of cases in which this method of treatment has been used, for only by such reports can the proper place of this antidote in the treatment of acute mercury poisoning be determined.

Sulfoxylate was used according to the method suggested by Rosenthal: [1] Gastric lavage was performed with a 5 per cent solution, 200 cc. of which was left in the stomach. An intravenous infusion, consisting of 10 Gm. of sulfoxylate dissolved in 200 cc. of water, was also given, and this was repeated, as Rosenthal advises, in cases which seemed severe. In addition to the antidote, the patients received the usual treatment directed toward preventing or correcting the physiologic disturbance which occurs in mercury poisoning, the treatment including measures to combat early shock; parenteral administration of water, dextrose and salt to prevent dehydration, acidosis and chloride depletion; intravenous administration of sodium bicarbonate to prevent acidosis; blood transfusions if significant bleeding occurred from the bowel, and appropriate symptomatic care.

In eighteen of the forty patients observed, 45 per cent, there developed symptoms of mercury poisoning, a proportion almost identical with the incidence of toxic manifestations of acute poisoning (44 per cent) in 278 cases of bichloride ingestion previously reported by us.[3] The patients in this series received antidotes other than sulfoxylate or no antidotes at all.

Fourteen of the forty patients treated with sulfoxylate died. This is a mortality of 35 per cent for the whole group, and of 78 per cent for the eighteen patients in whom symptoms of mercury poisoning developed. In the 278 cases of bichloride ingestion just mentioned, the mortality for the whole series was 24 per cent and for the patients who had acute mercury poisoning 53 per cent.

Although the results of this study are not statistically significant because of the small number of cases observed, they do indicate that the use of sulfoxylate did not result in any protection against the toxic effects of bichloride ingestion. Indeed, the mortality for the series of cases in which it was used, 78 per cent, as compared with the mortality for the series in which it was not used, 53 per cent, raises the question as to whether its use was not actually harmful in the patients who had definite mercury poisoning after bichloride ingestion. This consideration becomes the more important in view of the experimental work of Brown and Kolmer,[4] Rosenthal [5] and Modell, Gold, Winthrop and Foot,[6] who demonstrated that in experimental mercury poisoning sodium formaldehyde sulfoxylate is of value in the prevention of the manifestations of poisoning but aggravates preexisting intoxication.

The value of sulfoxylate as an antidote in bichloride ingestion depends on its ability to convert mercuric chloride to an insoluble mercurous compound. This conversion can take place only if the antidote is administered promptly after the ingestion of the poison. If its administration is delayed, the lapse of time permits the absorption of a lethal quantity of mercury and considerable corrosion of the gastrointestinal mucosa. In other words, such conversion of the mercury bichloride to an insoluble mercurous compound as does take place is incomplete and occurs too late to be of value. Undoubtedly this line of reasoning explains the failure of sulfoxylate in the forty cases we are reporting: As usually happens, most of the patients were not seen until an hour or more after they had ingested the poison, and then it was too late for the antidote to be effective.

SUMMARY AND CONCLUSIONS

Forty patients who had ingested mercury bichloride were treated with sodium formaldehyde sulfoxylate as an antidote, with a mortality for the whole group of 35 per cent. Eighteen of the forty patients, 45 per cent, became toxic, of whom fourteen, 78 per cent, died. The general results are no better than those obtained by other therapeutic measures and, if only the patients who

From the Department of Medicine of the Louisiana State University School of Medicine and the Medical Services of Charity Hospital.

1. Rosenthal, S. M.: Antidote for Acute Mercury Poisoning, J. A. M. A. **102**:1273 (April 21) 1934.

2. Monte, L. A., and Hull, Edgar: Bichloride of Mercury Poisoning: Sodium Formaldehyde Sulfoxylate as an Antidote, South. M. J. **27**:988 (Dec.) 1934.

3. Hull, Edgar, and Monte, L. A.: Bichloride of Mercury Poisoning: A Statistical Study of 302 Cases, South. M. J. **27**:918 (Nov.) 1934.

4. Brown, Herman, and Kolmer, J. A. Sodium Formaldehyde Sulfoxylate in Experimental Acute Mercurial Poisoning, J. Pharmacol. & Exper. Therap. **52**:462 (Dec.) 1934.

5. Rosenthal, S. M.: The Use of Sodium Formaldehyde Sulfoxylate in Acute Mercury Poisoning, J. Pharmacol. & Exper. Therap. **54**:34 (May) 1935.

6. Modell, Walter; Gold, Harry; Winthrop, G. J., and Foot, E. B.: Sodium Formaldehyde Sulfoxylate in Experimental Poisoning by Mercuric Chloride, J. Pharmacol. & Exper. Therap. **51**:66 (Sept.) 1937.

had symptoms of poisoning are considered, the mortality of 78 per cent suffers by comparison with the mortality of 53 per cent reported by us in a series of 278 cases in which other methods of treatment were used.

Our experiences with sodium formaldehyde sulfoxylate seem to warrant the following conclusions:

1. No antidote suggested to date should in any way replace treatment directed toward combating physiologic changes which occur in acute mercury bichloride poisoning.

2. If sodium formaldehyde sulfoxylate is to be of any value as an antidote, it must be administered almost immediately after the ingestion of the bichloride.

3. Repeated use of sodium formaldehyde sulfoxylate in cases of mercury poisoning is probably inadvisable.

THE FREQUENCY OF COEXISTING GALLBLADDER AND CORONARY ARTERY DISEASE

A STATISTICAL ANALYSIS AND BIOMETRIC EVALUATION OF 1,493 NECROPSIES

HERBERT S. BREYFOGLE, M.D.

KANSAS CITY, MO.

As early as 1878 [1] the association between gallbladder disease and heart disease was noted. Much recent comment, preponderantly favoring a significant relation between the two, has appeared in the literature. Many of these contributions have indicated a more than incidental relationship between cholecystic disease and coronary artery disease, although some authors deny that such a connection exists.

In 1935 eighty-eight cases of coronary artery disease with necropsy showing a striking frequency of gallbladder disease were reported from this laboratory.[2] This series was small and had not been subjected to biometric study. Moreover, neither the age incidence nor the freqeuncy of gallbladder disease not combined with coronary artery disease had been determined for comparison. Therefore a larger series of necropsies was subjected to critical analysis with attention to all of the foregoing points.

To determine accurately what significance there might be, if any, in the coexistence of gallbladder disease and coronary artery disease in patients dying primarily as a result of the latter, two selected groups of records were chosen from 1,493 consecutive necropsy protocols filed in the department of pathology from 1928 to 1939.

The first series comprised 162 records. In these there were changes in the coronary vessels and myocardium considered to be the primary cause of death or the most significant contributing factor. The pathologic alterations consisted of occlusion of one or more coronary arteries by thrombosis or atherosclerosis with or without myocardial infarction or myosclerosis and mild to advanced coronary atherosclerosis with varying degrees of myosclerosis.

The second group comprised 363 records chosen on the basis of evidence of acute or chronic inflammatory gallbladder disease and the presence of gallstones.

From the Department of Pathology, St. Luke's Hospital.

1. Guéneau de Mussy, quoted by Revilont: Gaz. d. hôp., 1878, p. 666, and by Schwartz, Morris, and Herman, Albert: Association of Cholecystitis with Cardiac Affections: Study Based on 109 Cases, Ann. Int. Med. 4: 783-794 (Jan.) 1931.

2. Wilhelmy, E. W., and Helwig, F. C.: Clinical and Pathologic Studies of Coronary Disease, J. Missouri M. A. 32: 476-480 (Dec.) 1935.

Comparisons were then made of the incidence of cholecystic disease in relation to (1) the total number of necropsies, (2) the coronary artery disease group, (3) the various age groups of the total series of necropsies and (4) the various age groups of the coronary artery disease group. Comparison was also made with respect to the incidence in certain types of coronary artery disease.

In addition, biometric analysis of the data thus obtained was made, as suggested by the report of Tennant and Zimmerman,[3] who used the biometric equation of Yule to calculate the coefficient of association for such a relationship as is being considered here.

RESULTS

Coronary Artery Disease.—Coronary artery disease considered to be the direct cause of death or the primary contributing factor, as judged by associated changes in the myocardium, occurred in 162 instances, or 10.8 per cent of the total number of necropsies. In 129 of these there was coronary occlusion, which in the greatest number of cases was due to atherosclerosis alone and in the remainder to coronary thrombosis alone or in combination with occluding atherosclerosis. Tabulated results and percentages are shown in table 1.

Myomalacia cordis was noted in seventy-nine instances in this group and advanced or extensive myosclerosis in seventy-five. Thirty-five records were encountered in which both changes were mentioned.

Gallbladder Disease.—Gallbladder disease was mentioned in 363 necropsy reports, or 24.3 per cent of the total number (1,493). In 115 of these it was listed as chronic adhesive pericholecystitis or as showing only adhesions, thickening, contraction or combinations of these. Two instances of acute fibrinous pericholecystitis were reported also. Excluding a total of 117 cases in which the question of an inflammatory lesion might be raised, the incidence is 16.4 per cent of the total, as shown in table 3. Record of cholecystectomy in which the gallbladder was reported as showing inflammatory changes, with or without stones, has been included also. Tabulation of the various types of gallbladder involvement is recorded in table 2.

In association with coronary artery disease, cholecystic disease was mentioned in seventy-nine reports. Tabulation of the details is included in table 2. Here, as before, question might be raised regarding twenty-four of these. Including them, the incidence of gallbladder disease in this group is 42.4 per cent; excluding them, 33.9 per cent, as shown in parenthesis in table 3.

Shown in table 1 is the percentage incidence of cholecystic disease in the various types of coronary artery disease. Correction has been made for doubtful instances of gallbladder involvement.

Comparing the incidence of the two most frequent types of gallbladder disease encountered in both groups, namely, chronic cholecystitis associated with stones, hydrops or other features, the contrast is striking, involving a 9.0 per cent incidence in the total group and a 21.6 per cent incidence in the group of coronary artery disease necropsies.

Age and Sex.—There was no consistent variation from the average in any group, male or female, so far as age was concerned. In a few instances the female averages were considerably above the general average,

3. Tennant, Robert, Jr., and Zimmerman, H. M.: Association Between Disease in the Gallbladder and in the Heart, as Evidenced At Autopsy, Yale J. Biol. & Med. 3: 495-503 (July) 1931.

and in one instance the average age of the male group was high. Averages for all groups, male and female, ranged from 58 to 65 years. The greatest number of reports were encountered in the age groups from 41 to 80, both in the general group and in the gallbladder group, as well as in the coronary group with and without gallbladder involvement.

The youngest man of the coronary group was 36 years old and the youngest woman 23. The latter showed a complete occluding coronary atherosclerosis,

TABLE 1.—*Analysis of 162 Cases of Coronary Disease*

Character of Lesion	Number	Per Cent of Total	Per Cent of Group	With Gallbladder Disease: Number	With Gallbladder Disease: Per Cent	Number Excluded	Corrected Percentage
Occluding atherosclerosis	59	3.5	36.4	20	50	11	38
Occluding atherosclerosis and coronary thrombosis	37	2.4	22.8	21	56	7	37
Coronary thrombosis	33	2.2	20.4	14	42	4	30
Advanced atherosclerosis	21	1.4	13.0	9	42	0	42
Mild to moderate atherosclerosis	12	0.7	7.4	5	41	2	25

Total number of necropsies, 1,493; total number with coronary disease, 162; total number with gallbladder disease, 363; total number with gallbladder disease and coronary disease, 79.

and the former coronary thrombosis with occluding atherosclerosis. One man aged 37 showed advanced coronary atherosclerosis and myosclerosis; a woman aged 35 showed coronary thrombosis and occluding coronary atherosclerosis. None of the four showed any evidence of gallbladder disease. The distribution of the numbers of each group according to age and sex is shown in table 3.

Comparison of the ...cidence of gallbladder disease according to sex is shown in table 3. Figures in parentheses are those obtained when doubtful instances of gallbladder disease were omitted from the calculation. In the general group this totaled seventy-five for the males and forty-two for the females; in the coronary group with gallbladder disease there were twenty-one men and two women in whom the recorded gallbladder changes were regarded as questionable.

Comparison of the incidence of gallbladder disease according to age and sex, particularly in the age group from 41 to 80, is shown in table 4. It is evident here that the occurrence of cholecystic disease in general is higher in the age group from 61 to 80 regardless of other conditions or sex. However, in the group of reports in which coronary disease and gallbladder disease were both noted there is an irregular incidence of this feature when the incidence according to sex is determined. In only one group, the women of ages from 71 to 80, is the incidence of gallbladder disease in association with coronary disease lower than that of the general group. The incidence, however, for the entire group of coronary disease necropsies is higher than for the corresponding general group of the same age (71 to 80). The percentages given for males and females of various age groups in table 4 do not include any questionable instances of gallbladder disease and should be compared with the corrected percentages in that table.

In all groups there was noted a preponderance of males. In the selected group of 363 instances of gallbladder disease, however, after exclusion of doubtful records, the male and female incidence was practically the same. Table 3 shows the comparative figures obtained in this connection.

Coefficient of Association.—The formula of Yule, as illustrated by Tennant and Zimmerman,[3] is as follows:

$$Q = \frac{N - \frac{(A)}{(AB)}\frac{(B)}{(AB)}}{2[(AB) - (A) - (B)] + N + \frac{(A)}{(AB)}\frac{(B)}{(AB)}}$$

where N represents the total number of necropsies, (A) the number of necropsies in which coronary artery disease was observed, (B) the number of necropsies in which gallbladder disease was observed, (AB) the number of necropsies in which both coronary artery disease as specified and gallbladder disease were observed, and Q the coefficient of association.

As stated by Tennant and Zimmerman,[3] if $Q = 1$ there is a complete positive association, and if $Q = -1$ there is complete dissociation.

Using this equation the present study yielded a coefficient of association of 0.55 for the 1,493 necropsy records examined. Excluding doubtful instances of gallbladder disease (117 of the general group and twenty-four of the coronary group) the equation yielded a figure of 0.50.

Coefficients were calculated also for the various age groups from 41 to 80 and for males and females. This is shown in table 5. The equation was also utilized in calculating a coefficient in which only the instances of chronic cholecystitis with additional involvement such as stone and hydrops were considered. The figure obtained was 0.54.

It will be noted that the coefficients obtained for the various age groups after exclusion of doubtful instances of gallbladder disease are lower than those calculated for the entire series, and for males and females. Of all age groups the coefficient for the group from 61 to 70 is the lowest. In this connection it is interesting to

TABLE 2.—*Various Types of Gallbladder Involvement*

Type of Gallbladder Disease	Entire Group: 1,493 Necropsies: Total	Male	Female	Coronary Artery Disease with Gallbladder Disease: Total	Male	Female
Acute cholecystitis	3	2	1	..	..	..
Acute fibrinous pericholecystitis	2	1	1	..	..	..
Chronic cholecystitis	32	17	15	5	5	0
Chronic cholecystitis with additional features (stones, hydrops, empyema, cholesterosis, rupture, infarction, acute cholecystitis)	135	66	69	35	27	8
Cholecystectomy, gallbladder showing chronic inflammation with or without stones	32	13	19	6	3	3
Cholesterosis	18	12	6	5	4	1
Cholesterosis with stones	1	1	0	1	1	0
Cholelithiasis	24	10	14	3	2	1
Hydrops	1	0	1	..	..	..
Thickening, adhesions, thickening and adhesions, contraction and adhesions, chronic adhesive pericholecystitis	115	78	37	24	22	2
Totals	363	200	163	79	64	15

note, although it is not being considered primarily in this study, that of eleven instances of diabetes in the coronary disease group eight occurred after the age of 60 and four in the age group from 61 to 70. All but one of these showed gallbladder involvement of unquestionable character.

Shown in table 5 are the coefficients obtained for the various groups, with and without exclusion of doubtful instances of gallbladder disease.

COMMENT

In 1931 Tennant and Zimmerman [3] found a significant association between heart disease in general and gallbladder disease in a biometric study of 1,600 necropsies, using the equation of Yule. They found, more particularly, a significant association with arteriosclerotic heart disease but noted that the association was considerably lower in the age groups after 51, in which most instances of both this type of heart disease and gallbladder disease lay. Included in their study, however, were carcinoma of the bile ducts, chronic pericholangitis and obstruction of the common bile duct, which are not included in this report.

Others have reported what they consider to be a significant association between coronary disease and gallbladder disease, Willius and Brown [4] noting a 24 per cent incidence of the latter in eighty-six instances of coronary sclerosis coming to autopsy, Bean [5] 17.5 per cent in 269 cases of cardiac infarction, 90 per cent of which were described as cholelithiasis alone, Miller [6] reporting 350 necropsies in which coronary thrombosis occurred more frequently in the presence of gallbladder disease, and Campbell [7] that the majority of ten patients with coronary thrombosis had demonstrable gallbladder disease.

With regard to heart disease in general, Brockbank [8] found in 1,347 necropsies that the presence of a cardiac lesion doubled the incidence of cholelithiasis. Mills and Bull [9] noted in 533 necropsies that cardiac disease favored the occurrence of cholelithiasis at an earlier age. Schwartz and Herman [1] observed the incidence of cardiac disease to be higher in the presence of cholecystitis. Leech,[9] however, in examining 116 instances of gallbladder disease, was unable to find any definite relationship with heart disease.

A number of observers [10] have reported improvement in heart disease, and more specifically in angina pectoris and coronary occlusion, following cholecystectomy. Attention has been called by several authors [11] to the presence of certain varying cardiac changes appearing during acute attacks of gallbladder disease. Schwartz and Herman [1] found mention of this by Oddo in 1893 and by others from 1878 to 1893 of a relation between gallbladder disease and heart disease.

Opinions with regard to the pathologic and clinical evidence presented in favor of such a relation vary. Leary [12] and MacCallum [13] regard infection in general as minor in significance in the pathogenesis of atherosclerosis; William Boyd [14] feels that chronic infection

TABLE 3.—*Age and Sex Incidence of Gallbladder Disease and Coronary Disease*

Age	General Group: 1,600 Necropsies			Gallbladder Group: 303 Necropsies			Coronary Group: 102 Necropsies			Coronary Group—Gallbladder: 79		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
0-10	61	40	21	..	..	..	..	..	..	..	..	..
11-20	80	41	39	1	1	..	..	..	..	..	..	..
21-30	129	56	73	5	1	4	1	..	1	..	..	..
31-40	170	85	85	17	3	14	5	4	1	..	..	..
41-50	229	132	97	70	40	30	29	25	5	14	12	2
51-60	281	176	105	80	50	30	37	34	3	19	16	3
61-70	289	182	107	99	53	46	49	36	13	20	14	6
71-80	160	113	56	65	38	27	32	26	6	17	15	2
81-90	42	25	17	21	10	11	7	4	3	6	4	2
91-100	5	2	3	3	2	1	..	..	..	..	..	..
No age given	25	13	15	2	2	..	5	5	..	3	3	..
Totals	1,600	885	608	363	200	163	102	122	39	79	64	15
Per cent		59.2	40.8		55 (59.8)	45 (49.2)		81.4	18.6		81 (76)	19 (24)
Percentage with gallbladder disease	24.3 (16.4)	22 (14)	26 (19)				42.4 (33.9)	48 (32)	50 (43)			

TABLE 4.—*Age and Sex Incidence of Gallbladder Disease*

Age	Percentage Incidence of Gallbladder Disease in Various Age Groups of 1,600 Necropsies							Percentage Incidence of Gallbladder Disease in Various Age Groups Showing Coronary Artery Disease						
	Number	With Gallbladder Disease		Number Excluded	Corrected, per Cent	Male, per Cent	Female, per Cent	Number	With Gallbladder Disease		Number Excluded	Corrected, per Cent	Male, per Cent	Female, per Cent
		Number	Per Cent						Number	Per Cent				
41-50	229	70	29.0	25	18.8	14	25	29	14	50.0	6	28.5	28	33
51-60	281	80	28.4	31	17.4	13	23	37	19	51.3	9	27.0	47	100
61-70	289	99	34.2	25	25.9	21	34	49	20	40.8	4	32.6	38	38
71-80	160	65	38.4	14	30.1	25	39	32	17	53.1	3	43.1	50	33

4. Willius, F. A., and Brown, G. E.: Coronary Sclerosis: An Analysis of Eighty-Six Necropsies, Am. J. M. Sc. **168**: 165-180 (Aug.) 1924.
5. Bean, W. B.: Infarction of the Heart, Am. Heart J. **14**: 684-702 (Dec.) 1937.
6. Miller, C. H.: Gallbladder and Cardiac Pain, Lancet **1**: 767-772 (Jan.) 1932.
7. Campbell, S. B.: Influence of Infections on the Incidence of Coronary Thrombosis, Brit. M. J. **1**: 781-786 (April 18) 1936.
8. Quoted by Rolleston and McNee.[37]

9. Leech, C. B.: Association of Gallbladder Disease and Heart Disease, New England J. Med. **200**: 1318-1321 (June) 1929.
10. Barnes, A. R.: The Cardiac Aspect of Surgical Risk, Proc. Staff Meet., Mayo Clin. **11**: 628-629 (Sept. 30) 1936. Graham, E. A.; Cole, W. A.; Copher, G. A., and Moore, Sherwood: Diseases of the Gallbladder and Bile Ducts, Philadelphia, Lea & Febiger, 1928. Fitz-Hugh, Thomas, Jr., and Wolferth, C. C.: Cardiac Improvement Following Gallbladder Surgery, Ann. Surg. **103**: 478-483 (Jan.) 1935. Willius, F. A., and Fitzpatrick, J. M.: Relationship of Chronic Infection of the Gallbladder to Disease of the Cardiovascular System, J. Iowa M. Soc. **15**: 589 (Nov.) 1925. Lichty, M. J.: Cardiac Affections from Gallbladder Disease and Appendicitis, Ohio State M. J. **11**: 779, 1915.
11. Osler, William: Principles and Practice of Medicine, revised by Thomas McCrae, ed. 11, New York, D. Appleton & Co., 1930. Reisman, David: The Development of Cardiac Murmurs During Attacks of Biliary Colic, J. A. M. A. **48**: 1589 (May 11) 1907. Flint, H. L.: Cholecystitis Heart, Brit. M. J. **2**: 819 (Nov. 27) 1920. Weiss, Samuel: Diseases of the Liver, Gallbladder, Ducts and Pancreas, New York, Paul B. Hoeber, Inc., 1935. Rehfuss, M. E., and Nelson, G. H.: Medical Treatment of Gallbladder Disease, Philadelphia, W. B. Saunders Company, 1936. Neuhof, Solian: The Heart, Philadelphia, P. Blakiston's Son & Co., 1923. Roberts, S. R.: Diagnostic Relations Between Gallbladder and Heart, Illinois M. J. **58**: 317-321 (Nov.) 1929.
12. Leary, Timothy: Atherosclerosis, Arch. Path. **21**: 419 (April) 1936.
13. MacCallum, W. G., in Cowdry, Edmund V.: Arteriosclerosis: A Review of the Problem, New York, Macmillan Company, 1933.
14. Boyd, William: Pathology of Internal Diseases, ed. 2, Philadelphia, Lea & Febiger, 1935.

is the most likely agent. Adam Boyd [15] comments that infections may be at work in continuing and advancing arteriosclerotic lesions already present and possibly due at the outset to an infectious process.

More specifically, with regard to gallbladder disease Bean [6] believes that cholelithiasis is not an etiologic agent but evidence of some primary disturbance in the lipoid-cholesterol metabolism which is probably also at fault in atherosclerosis. Warren [16] agrees with this in connection with the high incidence of cholelithiasis and arteriosclerosis in diabetes. Rolleston and McNee,[17] however, suggest that heart disease favors the formation of gallstones by tending to make life more sedentary and leading ultimately to stagnation of bile. Miller,[9] Fitz-Hugh and Wolferth,[10] Mayo [18] and Babcock [19] state that gallbladder disease may damage the myocardium, dispose to arterial degeneration or initiate changes in the coronary vessels.

It is apparent from this study that the general incidence of gallbladder disease is higher in the presence of coronary artery disease of the types specified here. In the general series this difference is 17.5 per cent and in the specific types of coronary involvement it ranges from 8.6 to 25.6 per cent, the difference in incidence being greatest in association with advanced atherosclerosis, coronary thrombosis, occluding sclerosis and combinations of the two conditions last mentioned.

A similar contrast is noted in the various age groups from 41 to 80, the difference ranging from 6.7 to 18.1 per cent, being highest in the groups from 41 to 60 and from 71 to 80. In males and females of the general and selected series the difference in incidence ranges from 18 to 24 per cent. In males and females of certain age groups the higher incidence of gallbladder disease in association with coronary artery disease is repeated, ranging from 15 to 34 per cent in males from 41 to 80 and from 4 to 77 per cent in the females of ages from 41 to 70. In the female age group from 71 to 80 the

TABLE 5.—*Coefficients of Association*

Group	Coefficient	Coefficient (No Doubtful Instances Included)
Entire series	0.35	0.39
41-80	0.36	0.39
41-60	0.32	0.31
61-80	0.24	0.27
51-70	0.34	0.36
41-50	0.46	0.39
51-60	0.32	0.32
61-70	0.17	0.29
71-80	0.35	0.32
Males	0.60	0.57
Females	0.52	0.53

incidence is 6 per cent lower in the coronary group than in the group without significant coronary artery disease.

Biometric analysis of the data obtained shows a positive association between cholecystic disease and coronary artery disease regardless of age or sex. The figures for the entire series and for male and female groups approach a complete positive association; those obtained for the various age groups from 41 to 80 are somewhat lower than these but remain positive. The lowest coefficient of association obtained was that for the ages from 61 to 70, but the occurrence of other factors not taken into consideration here indicates the need for further evaluation of these factors in the general group. It should also be taken into consideration that while a large number of instances of gallbladder disease were excluded from the calculations, as noted in the various tables, many of these might be included after further microscopic examination.

CONCLUSIONS

A statistical study of 1,493 necropsy records indicates a striking and positive association regardless of age or sex between gallbladder disease and coronary artery disease where the latter is regarded as the direct cause of death or the primary contributing factor toward death.

15. Boyd, Adam: Inflammatory Basis for Coronary Thrombosis, Am. J. Path. 4: 159-166 (March) 1928.
16. Warren, Shields: Pathology of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1930.
17. Rolleston, Humphry, and McNee, J. W.: Diseases of the Liver, ed. 3, London, Macmillan Company, 1929.
18. Mayo, W. J.: Certain Medical and Surgical Aspects of Biliary Apparatus, Illinois M. J. 45: 33-37 (Jan.) 1924.
19. Babcock, R. H.: Chronic Cholecystitis as a Cause of Myocardial Incompetence: Report of Thirteen Cases, J. A. M. A. 52: 1904-1911 (June 12) 1909.

CEREBRAL SYMPTOMS IN FEVER THERAPY

WITH ESPECIAL REFERENCE TO CEREBRAL HYDRODYNAMICS AND PRESSURE-VOLUME RELATIONSHIPS: A STUDY OF FOUR CASES

OSCAR T. WOOD, M.D.
AND
AUGUSTUS McCRAVEY, M.D.
PHILADELPHIA

Certain definite physical and hydrodynamic alterations take place intracranially during fever therapy and demand immediate recognition by the clinician or technician in charge. Certain dangers incident to treatment can thus be avoided, the patient made more comfortable and the management of certain diseases made more efficacious by proper treatment.

It is important to recognize early symptoms and signs of cerebral anoxia and edema which are produced during the course of artificial fever therapy. The recognition of certain characteristic manifestations of cerebral hyperemia is equally important. By properly timed spinal drainage, the intracerebral pressure and volume relationships can be maintained at a normal level and the dangerous phases of cerebral anemia and hyperemia can be prevented. It is a well recognized fact that serious and permanent brain damage may occur when either state prevails.

During the course of hyperpyrexia several salient physiologic changes are recognized.[1] In the induction phase there is a mild circulatory embarrassment due to a rapid drop in the cardiac ventricular filling time, while the emptying time drops only slightly. The filling time is actually shorter than the emptying time, manifesting itself clinically in mild apprehension and weakness. These alterations are produced by peripheral vascular collapse. The so-called compensatory phase takes place at from 103 to 104 F. and there is less circulatory embarrassment. This mechanism, while a part of the picture, is not dangerous.

Peripheral vascular collapse takes place, as evidenced by a rapid fall in diastolic pressure.[1] The diastolic pressure is often completely abolished, pointing to a mild induced strain on the cardiac musculature.

Miss Irene Neider, R.N., assisted during this study.
From the services of Dr. Charles L. Brown and Dr. Temple Fay. Dr. Wood is clinical assistant in medicine and Director of the Department of Physical Medicine; Dr. McCravey is Fellow in neurosurgery.
From the Departments of Medicine (Dr. Wood) and Neurosurgery (Dr. McCravey) of the Temple University Medical School and Temple University Hospital.
1. Krusen, F. H., and Elkins, E. C.: Fever Therapy by Physical Means, J. A. M. A. 113: 1689-1696 (April 29) 1939.

Increased meningeal permeability has long been known to take place during the course of high fever, in toxic states and in the presence of pathologic lesions such as meningitis.[2] This can be proved by determining the bromide quotient.

Increase in spinal fluid volume and pressure relationships as shown in this series of cases is a result of increased meningeal permeability which produces a compensatory elevation of the systolic blood pressure and, in turn, pulse pressure. Cushing and Becht [3] believe that, when the intracranial pressure approaches that of arterial blood, the arterial pressure will rise higher to compensate in order to maintain adequate cerebral circulation. Manometric determinations show a definite increase in cerebrospinal fluid pressure and volume during artificially induced fever. However, as pulse pressure has been considered 40.[4] In case 1, treatment 1, the pulse pressure went as high as 122.

The clinical status of such patients is usually that of stupor and drowsiness. We interpreted these signs as being due to cerebral anoxia, the result of an increase in cerebrospinal fluid volume and decrease in cerebral blood volume. The spinal pressure may not be increased and is not a direct index of the amount of anoxia present. The spinal fluid pressure is simply the index of the apposition of two volumes and tells us nothing as to which volume is greater, blood or cerebrospinal fluid. In all our cases when these signs and symptoms were present, reduction in spinal fluid volume by lumbar puncture and drainage of from 24 to 48 cc. increased the blood volume circulating through the brain and was followed by a prompt fall of the pulse pressure to

Summary of Four Cases

		Before Temperature Elevation							Height of Temperature (Average 104 F.)						After Spinal Drainage					
					Cerebrospinal Fluid, Mm. Hg							Cerebrospinal Fluid, Mm. Hg					Cerebrospinal Fluid, Mm. Hg			
Case, Age, Sex, Diagnosis	Date Treated	Blood Pressure	Pulse Pressure	Medication	Initial Pressure	Final Pressure	Total Drainage	Mental Status	Blood Pressure	Pulse Pressure	Mental Status	Initial Pressure	Final Pressure	Total Drainage	Blood Pressure	Pulse Pressure	Initial Pressure	Final Pressure	Total Drainage	Mental Status
1 ♂ 6	3/ 7	160/60	40	None	No drainage			Normal	142/30	122	Stupor	28	10	28	130/70	50	..	..	..	Reactive, alert
6 Chorea	3/14 4/ 4	118/70 100/70	48 30	None Soluble phenobarbital, ½ gr.	2 16	2 0	2 30	Normal Normal	120/60 148/70	60 78	Mania Mania	6 5	2 0	2 17	106/50 100/70	56 30	.. —24 hr. later— 14	..	.. 17	Maniacal While T. was over 100 F. patient was maniacal
2 ♂ 50 Multiple sclerosis	2/ 7 3/ 9	——No observations—— 160/70	30	None	8	0	28	Normal Normal	No observations 142/58	84	Stupor Stupor	12	2	30	——No observations—— 120/70	50	..	..	..	Stuporous Reactive, alert
3 ♂ 10 Central nervous system syphilis	5/ 4 5/ 9 5/11 5/16	130/60 116/70 118/70 122/60	70 46 48 62	None Pantopon ½ gr. None None	8 10 .. .	0 0	26 30	Euphoria* Euphoria Depression psychosis Depression psychosis	150/30 134/50 140/65 138/30	120 83 85 88	Stupor Restless Restless Stupor	12 12 4 No drainage	0 0 0	42 48 3	120/60 134/60 108/55 160/55	70 74 51 105	.. —24 hr. later— 6 .. .. No drainage	.. 0 ..	.. 30 ..	Reactive, euphoric Reactive, euphoric Depression psychosis Irrational, stuporous
4, ♂, 47 Multiple sclerosis	6/ 6 6/ 8	130/80 130/80	50 40	None None	.. ..	.. ..	.. ..	Normal Normal	120/75 140/90	55 50	Stupor Irrational	10 No drainage	0	24	110/75 ——No observations——	45	..	..	..	Reactive, alert Irrational

* Patient had been euphoric before treatment.

shown in most of our cases, the volume of cerebrospinal fluid was a more accurate index of cerebral anemia than the pressure alone. This has long been recognized by Temple Fay.[4]

The surprisingly high pulse pressure found in these cases strongly parallels the observations made in acute cerebral trauma and wet brain, in which it has been shown to be related to cerebral anoxia. The double mechanism of peripheral vascular collapse causing low diastolic pressure, and a compensatory elevation of systolic blood pressure, is found in patients subjected to hyperthermic treatments. The increased cerebral pressure and volume relationships noted during hyperthermia, we believe, influence the vasomotor centers. We have found the pulse pressure to be the best clinical index as to the state of cerebral circulation. The normal normal, the mental state also returning to normal as evidenced in case 3, treatment 1.

When total spinal drainage preceded fever induction, thereby depleting the intracranial water bed, increased cerebral activity during hyperthermic treatment was evidenced by the maniacal reactions of the patient (treatment 2, case 1). These reactions were noted during the initial phase of induction. In treatment 3, case 1, 2 grains (0.1 Gm.) of soluble phenobarbital did not manifest the slightest sedation effect on an 8 year old boy. In both these instances a low intracranial cerebrospinal fluid volume was induced and reciprocally permitted cerebral hyperemia (Munro-Kellie doctrine).

This abnormal cerebral hyperemia we believe favors increased metabolic activity and function of cerebral centers as well as favoring a temporarily disturbed water balance. Thus stupor may be considered as a result of cerebral anoxia and delirium as a result of hyperemia. It is dangerous to continue fever therapy in altered physiologic states which are not susceptible to hydrodynamic control.

2. Neymann, C. A.: Artificial Fever Produced by Physical Means, Springfield, Ill., and Baltimore, Charles C. Thomas, Publisher, 1938, p. 55.
3. Cushing, Harvey, and Becht, F. C., cited by Ferris, E. B., Jr.: J. Clin. Investigation **18**:19 (Jan.) 1939.
4. Fay, Temple: Ann. Surg. **101**:76 (Jan.) 1935.

METHOD

1. Patients with varied disease conditions and of various ages were selected for observation.

2. Electromagnetic induction was used to produce hyperpyrexia.

3. The blood pressures, pulse pressures, pulse rate, respiratory rate and mental state were noted every fifteen minutes during the course of fever.

4. Spinal puncture with pressure and volume determinations was done at 104 F.

5. Immediately after spinal puncture the temperature, pulse rate, respiratory rate, blood pressure, pulse pressure and mental state were recorded.

COMMENT

In this series we have shown that the extreme states of cerebral anoxia and hyperemia do occur and can be readily recognized clinically.

The salient feature noted is the dramatic clinical change produced by disturbance of intracranial volume-pressure relationships. The depth of the stupor was proportional to the height of the pulse pressure. Stupor was abolished, pulse pressure assumed a normal level and the patient was more alert after spinal drainage. When a complete spinal drainage was performed immediately prior to fever induction, the opposite clinical picture showed itself, i. e. mania, irritability, rapid pulse and respiration and relatively low pulse pressure. We have found pulse pressure to be the best clinical index as to the state of cerebral circulation. Spinal drainage at the height of the fever curve in these cases showed a low volume and low pressure reading. From 15 to 20 cc. was considered a normal complete spinal fluid drainage.

It is obviously important that one should be able to stabilize such a relationship in order to prevent drastic consequences. Certain untoward and critical symptoms which have occurred during fever therapy may be explained on this basis and could have been prevented if the importance of the intracranial relationships of volume and pressure had been more clearly visualized.

The unwarranted use of opiates when vital centers are already depressed by profound cerebral anemia would indeed seem hazardous.

SUMMARY

1. Cerebral hydrodynamics was studied in four cases of fever therapy. A total of twelve treatments was given.

2. The pulse pressure was found to be the best clinical index for determining the state of cerebral circulation.

3. Cerebral anoxia can be relieved by properly timed and sufficient removal of cerebrospinal fluid.

4. Cerebral hyperemia can be prevented by sufficiently stabilizing intracranial volume-pressure relationships.

Glucose and Glycogen.—Grape sugar or glucose is the form into which starchy food is changed in order to be suitable for use in the body. Of all energy-yielding materials supplied by the food, glucose is the most readily serviceable. When it is provided in abundance it is preferably utilized; the burning of fat is then almost completely stopped. Furthermore, according to present views, glucose or its storage precursor, glycogen, is essential for muscular contraction. The substance is continuously being used, therefore; even during sleep the heart muscle and the muscles of respiration are consuming glycogen, and it can be renewed only periodically.—Cannon, Walter B.: The Wisdom of the Body, New York, W. W. Norton & Co., Inc., 1939.

Clinical Notes, Suggestions and New Instruments

ASCORBIC ACID IN THE TREATMENT OF CHRONIC LEAD POISONING

REPORT OF A CASE OF CLINICAL FAILURE

ARTHUR M. DANNENBERG, M.D.
ARNOLD H. WIDERMAN, M.D.
PHILADELPHIA
AND
PAUL S. FRIEDMAN, M.D.
NEW YORK

Holmes, Campbell and Amberg[1] recently reported evidence of the value of ascorbic acid in chronic lead poisoning. They administered 100 mg. of ascorbic acid daily to thirty-four workers who suffered clinically from excessive absorption of lead. With this treatment the blood picture as well as the clinical symptoms showed decided improvement. A further study by them of three house painters who suffered from chronic lead poisoning reinforced the conclusions drawn from the study of the factory workers.

The opportunity to study the effect of this vitamin in a case of lead poisoning presented itself to us:

R. M., a white boy aged 27 months, was admitted Sept. 30, 1939, with the following history: His birth was spontaneous and without difficulty. Development appeared to be normal until he was approximately 15 months old, when he began to eat wood, paper and painted articles. Parental control of the abnormal appetite met with little success. In May 1939, at the age of 23 months, he was studied in the outpatient department of another institution, but nothing significant was found, although blood studies and x-ray examination of the long bones were made.

In July, two months before admission, he began to vomit, immediately after and between meals. The vomiting at first was intermittent but later became persistent. Inability to walk or to sit upright gradually developed and, three days before admission, internal strabismus of both eyes was noted for the first time by the mother.

On physical examination the child was pale, somnolent and irritable. The rectal temperature was 100 F., the pulse rate 108 and the respiratory rate 30 per minute. The head had prominent frontal bosses and was flattened in the anteroposterior diameter. Macewen's sign was elicited. The sternum had a typical "pigeon breast" deformity. The eyes showed bilateral external rectus palsy. The fundi were normal. A slight postnasal discharge was present, but otherwise nothing abnormal was found in the ears, nose, mouth or pharynx. The heart, lungs and abdomen were likewise normal. Neurologic examination showed hypotonia of all the muscles and the presence of all tendon reflexes. The Kernig and Brudzinski signs were not present. There was no nuchal rigidity. The Babinski sign was present on both sides. He had coarse muscle tremors on motion of the extremities.

A diagnosis of chronic lead intoxication with lead "encephalosis" was made and confirmed by the presence of basophilic stippling in the red blood cells and the characteristically increased density and width of the zone of provisional calcification of the long bones on x-ray examination.

For seventeen days the treatment consisted of the daily administration of ascorbic acid 100 mg. by mouth in divided doses and 250 mg. intravenously. In spite of this treatment, the child grew steadily worse. The vomiting, which could not be controlled by sedatives, persisted to such a degree that parenteral fluids had to be given. The weight dropped from 36 to 26 pounds (16.3 to 11.8 Kg.) and he became markedly emaciated. Somnolence and weakness increased while his tremulousness was intensified by the muscular wasting. Except on admission, lumbar punctures revealed no great increase in cerebrospinal fluid

From the Pediatric Department of the Jewish Hospital, Philadelphia.

1. Holmes, H. N.; Campbell, Kathryn, and Amberg, E. J.: Effect of Vitamin C on Lead Poisoning, J. Lab. & Clin. Med. 24:1119 (Aug.) 1939.

pressure, and analyses did not deviate from the normal. Other laboratory studies included serial blood counts, shown in the accompanying table. The lead in the blood [2] October 12, twelve days after onset of treatment, was 0.257 mg. per hundred cubic centimeters (normal 0.02 mg.).

For the first time on October 17 examination of the fundi revealed bilateral choked disks. Because of the child's poor condition it was deemed best to discontinue the ascorbic acid therapy. Instead, 10 cc. of a 10 per cent solution of disodium phosphate was given four times a day. In addition, a daily dose of forty-five drops of viosterol and 50 mg. of ascorbic acid were given. This was supplemented by a high calcium and phosphorus diet, which included 1 quart of milk and the yolks of two eggs. October 20, a daily dose of thiamin chloride 10 mg. and 1 cc. of liver extract, 2 U. S. P. units, were also begun.

After a few days on this regimen it was noted that the vomiting was becoming less frequent. Within ten days there was a marked improvement in the patient's general condition. This occurred in spite of an acute attack of nasopharyngitis, from which he promptly recovered. The vomiting ceased and his appetite improved. Gradually the child began to recognize objects, play feebly with his toys, obey commands and seem more cheerful. Seventeen days after the new regimen was started he sat up without support, and six days later he could walk, although his gait was ataxic. His nutritional state had markedly improved and, with the increased vigor, muscular tremor became less marked. Papilledema gradually lessened and a definite improvement of the internal squint of the right eye was noted. The number of stippled cells rapidly diminished as clinical improvement occurred, as shown in the table.

Results of Laboratory Studies on the Blood

Dates	Red Blood Cells	Hemoglobin, Gm.	Reticulocytes, per Cent	Stippled Cells, per Cent	White Blood Cells	Lymphocytes, per Cent	Polymorphonuclears, per Cent	Blood Lead, Mg. per 100 Cc.	Comment
10/ 1	.....	...	...	8.0	.....	..	..	.....	Ascorbic acid therapy; somnolence, muscular tremors, persistent vomiting, marked loss in weight, choked disks
10/ 2	2,800,000	6.7	...	...	22,600	46	54	.....	
10/ 6	4,000,000	8.2	4.0	7.2	.....	..	..	.....	
10/12	.....	...	...	6.0	24,000	18	82	0.257	
10/17	3,400,000	8.0	...	5.8	24,000	22	78	.....	
10/22	.....	...	...	5.4	.....	..	..	.....	Disodium phosphate therapy; prompt cessation of vomiting
10/29	3,000,000	7.1	4.4	5.0	20,500	26	74	.....	
11/ 3	.....	...	4.8	4.9	.....	..	..	.....	
11/14	3,600,000	9.1	...	0.6	8,400	45	55	0.190	Marked improvement in mental and physical symptoms
11/17	.....	...	...	0.0	.....	..	..	.....	
12/ 4	4,650,000	10.5	...	0.2	8,300	60	40	.....	
12/14	4,100,000	10.3	...	0.0	10,400	39	61	.....	

CONCLUSIONS

Extremely large doses of ascorbic acid were without effect in the treatment of lead intoxication in a child aged 27 months.

235 South Fifteenth Street.

2. Dr. John G. Reinhold and his staff at the Philadelphia General Hospital made the blood lead determinations.

INCREASED INTRACRANIAL PRESSURE ATTRIBUTED TO VENOUS OBSTRUCTION

BENEFICIAL EFFECT OF UPRIGHT POSTURE

ARTHUR D. ECKER, M.D.; WARDNER D. AYER, M.D., AND FREDERICK J. O'CONNOR, M.D., SYRACUSE, N. Y.

Serous meningitis,[1] otitic hydrocephalus,[2] pseudotumor or pseudo-abscess of the brain, intracranial serous effusions and intracranial hypertension of unknown cause [3] are synonymous terms when applied to a specific syndrome of increased pressure in the cerebrospinal fluid marked by headache, failing vision, papilledema and occasionally vomiting.

The apparent general well-being of the patient and normal conditions (except for papilledema) on neurologic examination are as impressive as the fact that pneumoroentgenograms reveal the ventricles of the brain to be normal in size, shape and position. General agreement on the cause of this condition has never been attained.

The following case report is submitted because the study of this patient has led to certain suggestions concerning the cause and treatment of this syndrome:

REPORT OF CASE

A white married woman aged 21, admitted to the University Hospital May 27, 1939, complained of chronically discharging ears for six years and of an exacerbation of pain and discharge for ten days. There were general malaise and poor appetite for one week. The rest of the history was irrelevant.

On admittance the patient, who was well developed and poorly nourished, appeared ill and apprehensive. The rectal temperature was 102.8 F., the pulse rate 110 per minute and the respiratory rate 25 per minute. Examination of the ears revealed pus in each external canal, obliteration of the drum markings and some serous discharge on the drums. There was tenderness anterior to the left auricle and over the left mastoid process. General physical examination yielded no other abnormal results.

The leukocytes numbered 11,240 per cubic millimeter of blood, of which 81 per cent were polymorphonuclears. Results of urinalysis were essentially normal. Roentgenograms revealed pneumatic mastoid processes and evidence of mastoiditis on the right with destruction. The Wassermann reaction of the blood was negative.

On the day of admission a lumbar puncture revealed clear, colorless fluid under a pressure of 20 cm. of water. Jugular compression on each side caused an abrupt rise in pressure of from 8 to 10 cm., which promptly receded on release. There were 5 cells per cubic millimeter of spinal fluid. Repetition of the lumbar puncture May 29 again revealed essentially normal spinal fluid under a pressure of 5.5 cm. of water.

Smears and cultures of the spinal fluid revealed no organisms. Culture of the discharge from the left ear revealed Staphylococcus aureus, diphtheroid bacilli and Streptococcus haemolyticus (beta). Eighty grains (5 Gm.) of sulfanilamide was administered daily for three days. A temperature of the remittent type varying between 103 and 100 F. (rectal) was observed. On the day after admission the patient had a chill and the temperature promptly rose from 99.6 to 102.8 F.

May 29 a simple left mastoidectomy disclosed hemorrhagic mastoiditis with no definite coalescence of the mastoid cells. The lateral sinus was exposed from the superior knee almost to the jugular bulb. The wall of the sinus appeared thickened and white. Then the sinus was opened and free bleeding was obtained. The wound was packed with iodoform gauze and closed.

On the day following operation the temperature did not exceed 102 F. A small amount of serosanguineous discharge was found when the dressing was changed. The patient received a transfusion of 500 cc. of citrated blood; her temperature continued to subside and remained normal after the second post-

From the Syracuse University College of Medicine, Departments of Medicine and Otolaryngology.

1. Davidoff, L. M., and Dyke, C. G.: Series of Cases of Serous Meningitis, Arch. Neurol. & Psychiat. 36: 1376-1380 (Dec.) 1936.
2. Williams, H. L.: Otitic Hydrocephalus, Arch. Otolaryng. 28: 632-652 (June) 1937.
3. Saha, A. L., and Hyndman, O. R.: Intracranial Hypertension of Unknown Cause: Cerebral Edema, Arch. Surg. 38: 428-442 (March) 1939.

operative day. The subsequent convalescence was uneventful except for a transitory mild left frontal headache. The patient was free from symptoms when dismissed on the thirteenth day after operation.

June 23, twelve days later, the patient was readmitted to the hospital complaining of pain in the left shoulder and left arm, intermittent headache and continuous "fuzzy" sounds referred to the right ear. There was pain referred to the right eye and orbit and there was some supra-orbital headache, which occasionally radiated over the vertex of the skull on the right side.

Examination of the ears revealed a large central perforation of the right drum with a small amount of serous discharge. There were a moderate amount of thick purulent discharge on the left side and also a large permanent perforation. The mastoidectomy wound appeared clean and was filling in with healthy granulating tissue. Except for an area 3.5 cm. in diameter of baldness on the scalp, general physical examination revealed an essentially normal status. The temperature on admission was 99.6 F. (rectal) and the pulse rate 80 per minute. Examination of the eyes showed them to be normal except for bilateral choked disks of 3 to 3.5 diopters with flame shaped hemorrhages and retinal edema. The visual fields were normal except for enlarged blind spots.

Spinal puncture performed June 30 revealed a pressure of more than 45 cm. of water. The fluid was clear and colorless and contained no cells. It contained 23 mg. of total protein, 750 mg. of chlorides (as sodium chloride) and 67 mg. of sugar (dextrose) per hundred cubic centimeters. The Wassermann and colloidal gold tests were negative.

Because of the intracranial hypertension, the patient's fluid intake was markedly restricted and magnesium sulfate was administered orally each day. July 2 a lumbar puncture revealed a pressure of 32 cm. of water. There was 1 cell per cubic millimeter, and attempted bacterial cultures were unsuccessful. June 3 there was an original spinal fluid pressure of 55 cm., and after 10 cc. of fluid was removed the final pressure was 28 cm. The Ayala index was calculated to be 5.1 but, as the patient was apprehensive and the original pressure varied from 43 to 60 cm. before any fluid was removed, it was questionable whether much reliance could be placed on the index.

The patient's course continued afebrile and the choked disks persisted despite the regimen of dehydration. She complained of occasional double vision and transitory pain in the right side of the face and behind the right eye. There was no paralysis of the external ocular movements.

Because of the persistence of the choked disks and even in the absence of cerebellar signs or of a visual field defect, it seemed wise to obtain a ventriculogram in the attempt to localize or exclude a brain abscess. Accordingly, July 12 ventricular estimation and attempted ventriculography were performed. With use of local anesthesia burr holes were made in each parieto-occipital region. Thirty-three cc. of fluid was obtained from the left lateral ventricle and 25 cc. from the right. This fluid was replaced by air. It was surprising that subsequent roentgenograms revealed no evidence of air in the ventricles but just a little air in the subarachnoid space under the burr holes.

The patient continued to have choked disks and blurred vision, and the spinal fluid pressure varied between 24 and 33 cm. of water. Except for persistence of the choked disks there were no neurologic abnormalities.

July 26 the reintroduction of needles into each lateral ventricle through the burr holes was attempted. The procedure was successful on the left side but unsuccessful on the right. At the same time, with the patient sitting upright, a spinal puncture needle was introduced into the second lumbar interspace. Approximately 150 cc. of spinal fluid was removed fractionally from the spinal subarachnoid space and a small amount of air was injected. During removal of the fluid, air was heard to be sucked in through the needle in the left lateral ventricle. Subsequent roentgenograms showed the left lateral ventricle filled with air and normal in size, shape and position, but none of the rest of the ventricular system was revealed. After this procedure the patient was drowsy and had transitory left facial palsy.

For the next two days she became very somnolent and ate but little. She preferred to curl up in bed and be undisturbed. From July 29 through August 1 the spinal fluid pressure varied between 30 and 49 cm. of water. Starting August 2 we insisted that the patient sit up in a chair most of the day. Her improvement in the next few days was striking. The sites of incision over the burr holes, which previously had been bulging, were now markedly flattened and the spinal fluid pressure was 12.5 cm.

August 7 the patient was asked to stay in bed on awakening until observations could be made. She had been sleeping all night on one pillow. At 7:52 a. m. there was considerable prominence of the skin over the burr holes. At this time the patient was asked to sit in a chair. There was no immediate change in tension of the skin. Three minutes later the skin over these incisions was beginning to soften and after ten minutes there were marked softening over the left burr hole and moderate softening over the right. At 9:08 a. m. the skin was flat over the left burr hole and very slightly bulging over the right. By 9:23 a. m. the skin over both trephine holes was flat. Later that day the patient was dismissed from the hospital with the advice that she take approximately seven glasses of fluid each twenty-four hours. She was to sit or stand up all day, and when she went to bed her head was to be elevated on three or four pillows.

When she was seen September 7, one month after dismissal from the hospital, her visual acuity without correction (A. M. A. chart) was 91.5 per cent in each eye. The right optic disk was flat. The left optic disk was marked by less than 1 diopter of papilledema nasally but none temporally. There was no definite pallor of either optic disk. The patient had no complaints and was generally in excellent health.[3a]

COMMENT

Pneumoventriculography is necessary in differentiating this type of intracranial hypertension from that secondary to an abscess or tumor of the brain. When ventriculography was attempted in this case there was immediate extrusion of the air from the ventricles out to the subarachnoid space under the burr holes. This phenomenon has been observed previously[4] and is of diagnostic value.[3] However, subsequent adequate roentgenograms of the ventricular system, often obtained by encephalography, are always normal in these cases.

In the literature it is frequently stated that there is some interference with the absorption of cerebrospinal fluid in patients with this syndrome. However, Sahs and Hyndman questioned this view because of the absence of dilatation of the ventricles and said "If this assumption is correct—that decreased absorption of cerebrospinal fluid is not the fault—only one other cause can remain, and that is swelling or edema of the brain." However, it must be recalled that damming the venous outflow from within the skull will also result in an increase of intracranial tension.

In a discussion of the paper of Davidoff and Dyke, Lawrence S. Kubie suggested that an elevation of systemic venous pressure might account for this syndrome. Accordingly the venous pressure of our patient was determined August 1, while the intracranial hypertension was still marked. In the antecubital fossa the venous pressure was 92 mm. (normal) and the circulation time was fourteen seconds. Another possible systemic factor that was considered was the osmotic pressure of the blood. Therefore a determination of the serum protein was made and found to be 7.4 Gm. per hundred cubic centimeters, a normal reading. There were 4.7 Gm. of albumin and 2.7 Gm. of globulin per hundred cubic centimeters of blood serum, and therefore there was no evidence of decreased osmotic pressure of the blood.

At the time of the mastoidectomy the left lateral sinus was opened and packed. This procedure could be expected to interfere with the venous outflow from within the skull and to increase intracranial pressure in two ways: (1) by increasing the amount of blood within the skull at any one time and (2) by interfering with absorption of fluid from the cerebral

3a. On Dec. 14, 1939, the optic disks were flat. The visual acuity was 100 per cent in each eye (A. M. A. chart) without glasses. The patient felt entirely well and lived normally.

4. Davidoff and Dyke,[2] Williams,[3] Sahs and Hyndman.[3]

capillaries, which in turn would tend to produce cerebral edema and perivascular transudation of fluid.

As a matter of fact, bilateral papilledema occurs frequently in thrombosis of the lateral sinuses.[5] Ordinarily the lateral sinus of the opposite side can take care of the extra volume of blood when one lateral sinus is thrombosed. However, anatomic variations of the venous sinuses are common, and if there is not adequate cross circulation at the torcular herophili or if the unobstructed lateral sinus is small there is resultant back pressure and consequently an increased intracranial pressure.[6]

Woodhall and Seeds[7] have shown that the markings on the inner table of the occipital bone, as revealed in the antero-posterior roentgenogram of the skull, correspond to differences in volume and distribution of the lateral sinuses. This roentgenogram of our patient clearly reveals that the left lateral sinus has at least twice the diameter of the right. Therefore the major venous drainage of the brain had to be carried by a relatively tiny vessel after the left lateral sinus was thrombosed. We surmise on the other hand that, if the right lateral sinus of this patient had been occluded, the left one, being much larger, could easily have carried the excess venous blood and the patient would have had no sequelae.

In this case, therefore, there was originally normal pressure in the cerebrospinal fluid. During mastoidectomy the left lateral sinus was opened and packed. Subsequently a state of persistently increased intracranial tension ensued. This intracranial hypertension responded neither to rigorous dehydrating measures nor to ventricular punctures. It did, however, disappear promptly (and the choked disks subsequently) when the patient's head was maintained higher than the rest of her body, which aided venous drainage through the remaining and collateral channels.

It is suggested that sterile thrombosis of the cerebral venous sinuses may underlie this syndrome in many cases and that the patient's posture should be considered in its management.

SUMMARY

A case of intracranial hypertension followed a mastoidectomy with opening and packing of a lateral sinus. This syndrome, otherwise known as serous meningitis or otitic hydrocephalus, is perhaps a matter of obstruction to venous outflow from the cranial cavity. Maintenance of the patient's head higher than the rest of the body was followed by prompt relief of the symptoms and increase in spinal fluid pressure as well as by early subsidence of the choked disks.

5. Walsh, F. B.: Ocular Signs of Thrombosis of the Intracranial Venous Sinuses, Arch. Ophth. **17**: 46-63 (Jan.) 1937.
6. Woodhall, Barnes, quoted by Walsh.[5]
7. Woodhall, Barnes, and Seeds, A. E.: Cranial Venous Sinuses: Correlation Between Skull Markings and Roentgenograms of the Occipital Bone, Arch. Surg. **33**: 867-875 (Nov.) 1936.

RAT MITE DERMATITIS

LEONARD F. WEBER, M.D., CHICAGO

Lately I was consulted by a group of department store employees, all of whom showed bites and dermatitis from scratching.

Four women and a man showed wheals and papules. Many of the papules and a few wheals showed a central punctum. The bites varied from five to forty in number on the women and numerous on the man. In the women the sites of predilection were the arms and forearms, while the man had an extensive eruption of the hands, ankles, legs, belt line, upper part of the shoulders and the neck. The itching varied according to the extent of the eruption. At the time of the first examination no parasites were found on the skin or clothing.

Bedbugs, fleas and other blood-sucking parasites had to be considered. A few clues in the history were valuable. No other members of the five families had a disease of the skin; this almost eliminated home environment as a factor. Additional proof to this statement was found in the experience of one woman, whose eruption disappeared on staying home ten days. She had a recurrence after going to the basement of the department store and this suggested that the bites were received while at her work. The point was brought out that if the women did not go to the stockroom in the basement for several days they were fairly comfortable. The man on the other hand, who had the trouble more abundantly, spent most of the working day in the basement. There was only one answer; the bites were received in the basement of the department store. I asked the man if any change had been made in his working conditions. Jokingly he admitted that the only change was to rid the store of rats. Now the cause of the bites narrowed itself to rat fleas or mites. The patients returned to work without being told about the probable cause of their bites. At the department store the following day I found mites on the patients' skin, on dead rats and on boxes of merchandise. The mites were put into a vial, taken to the office, and identified as Liponyssus bacoti. I was assisted by Dr. Bedford Shelmire in confirming the parasite.

I began to see the reason for the bites on the arms and forearms in the women. Occasionally they would go to the basement to replenish stock that was in boxes on shelves, which permitted the mites to crawl from their hiding place on the skin. The more direct contact with the rat mites, in various places of the basement during the working day, accounted for the man's generalized eruption.

The natural host of the mite is the brown rat (Mus norvegicus). Rat mites crawl during the day and night in search of food. They were attracted to the patients for food after their natural hosts, the rats, had been driven out. The mites were destroyed by fumigation with hydrocyanic acid gas and the trouble has not recurred.

In my patients only bites and consecutive cutaneous lesions were present, but the possibility of typhus fever was not overlooked. Shelmire and Dove reported that the tropical mite was the vector of endemic typhus in Texas. Whenever rats are removed from a building and after a period of two to three weeks bites appear on people working or living in the building, the presence of rat mites should be investigated. Rat mite dermatitis has not been reported heretofore in this country except in the South by Shelmire,[1] but it must be borne in mind, as my experience proved.

7 West Madison Street.

ANGIONEUROTIC EDEMA DUE TO TOBACCO SENSITIVITY AND THROMBO-ANGIITIS OBLITERANS IN THE SAME PATIENT

SAMUEL SILBERT, M.D., NEW YORK

This case is reported because of its unique interest and for the further support which it brings to the accumulated evidence that in cases of thrombo-angiitis obliterans there is a constitutional sensitivity to tobacco.

A man aged 44, American born and a lawyer, first seen Dec. 30, 1936, gave a history of attacks of angioneurotic edema for eight years. These attacks at first were rare but gradually became more frequent and for some weeks had occurred almost daily. They involved chiefly the lips and eyelids but had occurred also in other parts of the body. He had no history of urticaria, hay fever, asthma or cutaneous eruptions. His grandfather had asthma. No other members of the family were subject to allergic manifestations. He had been to numerous skin specialists and had been given tests for protein sensitivity. Elimination of various substances from his diet or environment, however, brought no relief from the angioneurotic edema. In view of the fact that he was a lawyer and in public life the occurrence of these attacks was a serious embarrassment to him.

He was referred to me by his physician not because of the angioneurotic edema but because of the gradual development of peripheral vascular disease in the legs. The history with regard to the latter condition was as follows: During the preceding five years he had had four or five attacks of superficial phlebitis in the left leg. For several years he had noticed gradually increasing pain in both calves after walking four or five blocks, relieved by momentary rest. Three weeks before

1. Shelmire, Bedford, and Dove, W. E.: The Tropical Rat Mite, Liponyssus Bacoti Hirst, 1914, the Cause of a Skin Eruption of Man, and a Possible Vector of Endemic Typhus Fever, J. A. M. A. **96**: 579 (Feb. 21) 1931.

he was first seen there suddenly developed numbness in the toes and sole of the right foot. He complained of considerable pain at night which was relieved by letting the foot hang over the edge of the bed. He began to smoke at the age of 13 and had been smoking three cigars and ten cigarets a day for many years.

The patient was tall, well developed and well nourished and he appeared to be in good general health. The general physical examination showed normal status except as follows: The upper lip was tremendously swollen on one side, so that the face was distorted. The right ulnar pulsation could not be felt and the Allen test was positive. All other pulsations in the upper extremities were palpable. Both hands were warm and there was no blanching of either upper extremity on elevation. There was coldness of the right foot, with rubor in the dependent position and marked blanching on elevation. There was no ulceration on either foot. Both femoral and both popliteal arteries were pulsating. The left anterior tibial and dorsalis pedis pulses were present; the left posterior tibial pulse was closed. A good pulsation was felt over the left lateral malleolus. There was no pulsation in the right foot. The oscillometer readings of the left leg were calf 7, ankle 3½; of the right, calf 2½, ankle faint. The blood pressure was 110 systolic, 68 diastolic. The urine was negative for albumin and sugar.

A diagnosis of thrombo-angiitis obliterans and angioneurotic edema was made. The patient was advised to stop smoking, and treatment for the circulatory condition was begun with intravenous injections of 5 per cent sodium chloride solution three times a week. A few weeks later he reported that the attacks of angioneurotic edema had practically stopped. At this time intradermal tests were done for tobacco, ragweed and timothy by Dr. Benjamin Rubin. Strongly positive reactions were obtained to all three allergens. The symptoms in the legs showed gradual and steady improvement. In April 1937 the rest pain in the right foot was almost gone and walking had improved. There was still numbness in the toes. In June the numbness was less and he was able to walk fairly well.

The saline injections were continued with gradually decreasing frequency and were finally stopped in February 1938. At this time there was no longer any numbness in the foot, and at a fair pace the patient was able to walk any distance without intermittent claudication. The oscillometer readings of the left ankle were 4 and of the right ankle one half. He reported that the attacks of angioneurotic edema had practically ceased. Once in three or four months when he had constipation a very slight attack might occur, but this was so slight that it was noticeable only to the patient and would not be apparent to a casual observer.

In July 1939 reexamination showed that he had maintained his improvement. There were almost no symptoms in the legs, and there were no attacks of angioneurotic edema. He played golf regularly and was fully occupied with the duties of his profession. For all practical purposes he had made a complete recovery from both conditions which troubled him in 1936 and was in perfect health.

COMMENT

For fifteen years I have emphasized the relation of the use of tobacco to the development and progression of thrombo-angiitis obliterans. In a recent publication[1] the evidence was summarized as follows:

"In a series of 1,200 patients with this disease that I have studied there is no instance of a typical and unquestioned case in a nonsmoker. In over thirty individuals with early thrombo-angiitis obliterans cessation of smoking alone was sufficient to cause relief of symptoms and improvement in circulation. Patients who continue to smoke are difficult to improve and their symptoms progress in spite of treatment. Those who have been restored to a good condition and who refrain from further use of tobacco remain in excellent health without recurrence of symptoms. More than 400 such individuals have been followed from two to thirteen years. When patients who have been well for many years resume the use of tobacco, recurrence of symptoms is the rule. Nearly 50 per cent of the patients who have required amputation persisted in smoking in spite of many warnings to stop."

Harkavy[2] has devoted considerable study to allergic manifestations in patients with thrombo-angiitis obliterans. In his most recent publication he reported positive cutaneous reactions to tobacco extracts in 78 per cent of a carefully selected series of 140 patients with this disease. Forty-four per cent of those giving positive cutaneous reactions had reagins to tobacco. It was also demonstrated by him that the urticarial wheal produced by the intradermal injections of tobacco extracts in the positively reacting patients showed histologically the presence of eosinophilic infiltrations typical of the allergic response. Thus his immunologic data corroborate the clinical evidence that patients with thrombo-angiitis obliterans have a specific sensitivity to tobacco.

The surprising coincidence in this case was the presence of another "shock organ," the vessels of the skin in addition to those in the extremities, subject to the same allergenic stimulation. The dramatic cessation in the attacks of angioneurotic edema immediately following discontinuation of the use of tobacco permits little doubt that this was the offending agent. Angioneurotic edema due to tobacco has not previously been recorded in the literature, although Harkavy[3] states that he has seen at least three cases.

1126 Park Avenue.

1. Silbert, Samuel: Amputations in Thrombo-Angiitis Obliterans, S. Clin. North America **18**: 389 (April) 1938.

2. Harkavy, Joseph, Hebald, Selian, and Silbert, Samuel: Tobacco Sensitiveness in Thrombo-Angiitis Obliterans, Proc. Soc. Exper. Biol. & Med. **30**: 104 (Oct.) 1932. Harkavy, Joseph: Tobacco Skin Reactions and Their Clinical Significance, J. Invest. Dermat. **2**: 257 (Oct.) 1939; Hypersensitiveness to Tobacco and Biopsy Studies of Skin Reactions in Vascular Disease, J. Allergy **9**: 475 (July) 1938.

3. Harkavy, Joseph: Personal communication to the author.

From the Medical Service of the New York Hospital and the Medical Department of Cornell University Medical College.

1. Schlesinger, Bernard; Signy, A. G.; Amies, C. R., and Barnard, J. E.: Etiology of Acute Rheumatism: Experimental Evidence of a Virus as the Causal Agent, Lancet **1**: 1145 (May 18) 1935.

Special Articles

THE PHARMACOPEIA AND THE PHYSICIAN

THE THERAPY OF RHEUMATIC FEVER

RUSSELL L. CECIL, M.D.
NEW YORK

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Rheumatic fever is still classified as a disease of unknown origin. However, authorities are pretty well agreed that the disease is infectious, and many students are convinced that it is closely associated with streptococcic infection. Whether the various inflammatory lesions are the actual sites of infection or whether they are the expression of some toxic reaction is still a matter for investigation. Recently the theory has been advanced that rheumatic fever is a virus disease, but so far the work of Schlesinger and his co-workers[1] has not been widely confirmed.

The pathologic changes observed in rheumatic fever are usually divided into two groups: (1) exudative lesions, such as those seen in the joints and in rheumatic pleurisy, and (2) proliferative lesions, such as those which occur in the myocardium and in the walls of the blood vessels. However, a sharp line of demarcation cannot be drawn between the two. A popular and plausible theory advanced by certain members of the

modern school, such as Swift,[2] Klinge[3] and others, is that both types of inflammation represent an allergic reaction to some antigen, presumably of a bacterial nature.

The symptoms in rheumatic fever result in great part from the inflammatory changes in the joints or in the heart. In adults, joint symptoms predominate; in children, symptoms referable to the heart are the more conspicuous. As a rule, symptoms of toxemia are more marked in adults than in children.

One of the most significant features of rheumatic fever is its close association with infections of the upper respiratory tract. In more than 50 per cent of cases the onset is preceded by tonsillitis or a sore throat. In others, there is a preceding history of sinusitis, otitis media, bronchitis or pneumonia.

TREATMENT

The treatment of rheumatic fever naturally falls into three divisions:

1. Treatment based on etiology.
2. Treatment based on pathology.
3. Treatment based on symptoms.

Treatment Based on Etiology.—Because of the great popularity of the streptococcus theory, a good many efforts have been made to develop a specific treatment for rheumatic fever. This has taken the form of streptococcus vaccine, nonspecific therapy, antistreptococcus serum and specific chemotherapy.

(*a*) The rationale of intravenous injections of streptococcus vaccine is based on the hypersensitiveness of rheumatic patients to streptococcus protein. The advocates of streptococcus vaccine have reasoned that, if the patient could be desensitized by a streptococcus vaccine, the rheumatic cycle could be shortened and the well known tendency to relapse lessened. The results, as reported by Wilson and Swift,[4] have not been conclusive. It is obvious that vaccine therapy would be of little value in the acute type of rheumatic fever. The vaccine usually employed is prepared from some strain of Streptococcus haemolyticus. The initial dose should not be more than 25,000 bacteria, administered intravenously, and increases should be gradual. Severe reactions are contraindications to increased dosage.

(*b*) Nonspecific therapy still maintains considerable popularity in the treatment of infectious diseases, and a number of observers have demonstrated its value in the treatment of rheumatic fever and allied conditions. A number of years ago I showed that acute attacks of rheumatic fever could be quickly terminated by intravenous injections of typhoid vaccine.[5] This finding has been corroborated by others. Sutton and Dodge[6] have induced rapid disappearance of chorea by the same method. These writers also found that in some cases of rheumatic carditis the symptoms promptly disappeared after the intravenous injection of typhoid vaccine.

My present attitude toward nonspecific protein therapy is definitely conservative; protein therapy has obvious disadvantages and should not be employed except in cases in which safer methods of treatment have failed. The initial dose of typhoid bacillus vaccine should be from 25 to 50 million intravenously for adults and 25 million or even less for children. Two or three injections are usually sufficient to bring about recovery.

(*c*) It has already been pointed out that the streptococcus origin of rheumatic fever has not been proved. The use of antistreptococcus serum, therefore, is a strictly empirical procedure. A polyvalent antistreptococcus serum has been recommended by Menzer[7] and others but has not met with a favorable reception.

There is no evidence to prove that the serum of patients who have recovered from rheumatic fever has any therapeutic effect.

(*d*) The striking effects obtained with sulfanilamide in acute streptococcic infections have naturally suggested its use in the treatment of rheumatic fever. Promising results have actually been reported by some of the German clinicians, but experience in this country has not been favorable. It is quite possible that in those few cases in which sulfanilamide has induced recovery the patients were suffering from a frank streptococcic infection of the joints which simulated rheumatic fever.

Treatment Based on Pathology.—Pathologic changes which occur in rheumatic joints have already been briefly described. The acute inflammatory changes which occur in the joints must be treated like any other acute arthritis. The patient should be put to bed and kept there until at least two weeks after all symptoms have disappeared. Complete rest is the keynote of treatment for this condition, and too much rest is certainly preferable to too little. The affected joints should be wrapped in cotton covered with gauze. The limbs will be much more comfortable if supported by pillows, placed so as to flex partially the inflamed joints. If the joints are very tender, a cradle should be placed over the patient to protect him from the pressure of bedclothes. Splints are rarely necessary, as the pain and swelling are usually of short duration; but it is important that the painful joints should be moved as little as possible during the acute stage of the disease.

Local applications of various kinds are often useful in relieving the pain. A saturated solution of magnesium sulfate is easy to prepare and is very popular with some physicians. The wet dressing should be covered with rubber sheeting to prevent evaporation, and the bandages should be moistened frequently. Another favorite local application is a 10 per cent ointment of methyl salicylate made up in petrolatum. Some preparations contain menthol in addition to the methyl salicylate.

PRESCRIPTION 1.—*Methyl Salicylate Ointment*

	Gm. or Cc.	
℞ Methyl salicylate	10	ʒiiss
Menthol	2	ʒss
Petrolatum, q. s. ad	100	ʒiiiss

Mix and make into an ointment.
Label: Apply locally.

Hot water bags are sometimes helpful but often fail to relieve the pain.

Physical therapy does not play an important role in the treatment of acute rheumatic fever. In cases in which the joint symptoms become subacute or chronic, diathermy, hydrotherapy and the application

2. Swift, H. F.: The Nature of Rheumatic Fever, J. Lab. & Clin. Med. **21**:551 (March) 1936.
3. Klinge, F.: Der Rheumatismus, Munich, J. F. Bergmann, 1933. (An excellent general review of the pathologic anatomy of the inflammatory rheumatic diseases and of the allergic hypothesis of their etiology.)
4. Wilson, May G., and Swift, H. F.: Intravenous Vaccination with Hemolytic Streptococci, Am. J. Dis. Child. **42**:42 (July) 1931.
5. Cecil, R. L.: A Report of Forty Cases of Acute Arthritis Treated by Intravenous Injection of Foreign Protein, Arch. Int. Med. **20**:951 (Dec.) 1917.
6. Sutton, Lucy P., and Dodge, Katherine G.: The Treatment of Chorea by Induced Fever, J. Pediat. **3**:813 (Dec.) 1933.
7. Menzer, Arthur: Serumbehandlung bei akuten und chronischem Gelenkrheumatismus, Ztschr. f. klin. Med. **47**:109, 1902.

of the infra-red and the ultraviolet rays may be in order. Massage and passive movements are contraindicated for the joints in the acute form of the disease but may be of value in the chronic form, at which time the treatment becomes more like that for chronic arthritis than for rheumatic fever. In cases of subacute or chronic disease, fever therapy is often of value. This may be carried out by means of typhoid vaccine intravenously or by artificial fever induced by exposure to thermal lamps.

Treatment Based on Symptoms.—As already indicated, the first duty of the physician is to put the rheumatic fever patient to bed and to insist on complete rest. His second duty is to make the patient as comfortable as possible by the use of heat and other local applications. His third duty is the administration of drugs that will relieve pain and curtail the activity of the disease.

Diet.—The diet in rheumatic fever is the same as that for any acute infection. During the febrile stage a soft diet is indicated, but after the temperature and pulse have returned to normal the patient may be allowed to eat almost anything that does not cause untoward gastrointestinal symptoms.

Medicinal Treatment.—The various compounds of salicylic acid have constituted the standard treatment of rheumatic fever for many years and in most cases give remarkably quick and striking relief to the patient. The exact mode of action of the salicylates in rheumatic fever is not known. Swift believes that the beneficial effect of salicylates is not attributable to increased production of immune bodies against the infectious agent. The well known anodyne effect of salicyl compounds is undoubtedly a factor, but this does not explain the immediate effect of the drug on the fever and on the swollen joints. It is possible that the salicylates achieve their effect by some sort of desensitization. When salicylates are properly administered, the pain and swelling in the joints rapidly disappear and the temperature drops to normal within twenty-four to forty-eight hours.

PRESCRIPTION 2.—*Sodium Salicylate and Sodium Bicarbonate Powders*

		Gm. or Cc.	
℞ Sodium salicylate Sodium bicarbonate	.....	āā 36	Six

Mix and divide into thirty-six powders.
Label: One powder in water every three hours.

Sodium salicylate is the most popular of the salicyl derivatives. It should be administered every two to three hours, by mouth, in doses of from 1 to 1.3 Gm. (15 to 20 grains), combined with an equal amount of sodium bicarbonate, until the symptoms are under control.

Swift advises from 1 to 1.3 Gm. (15 to 20 grains) of sodium salicylate every hour for eight to ten doses or until the first signs of intoxication appear. The physician should be watching carefully for evidence of salicyl intoxication, as in many cases the therapeutic and toxic doses are not far apart. On the second day of treatment the same dosage may be continued or, if the patient is greatly improved or shows signs of intoxication, the dose may be cut to three fourths or one half of the previous dosage and continued at this rate until all signs of active infection have been absent for a week or ten days. The symptoms of salicyl intoxication are nausea, vomiting, ringing in the ears, disturbances of vision and delirium. Renal irritation is also a frequent toxic manifestation and is detected by urinalysis.

If sodium salicylate upsets the patient's stomach, acetylsalicylic acid may be substituted with advantage. In my experience this drug sometimes produces a better therapeutic effect than sodium salicylate. The dosage is the same as that for sodium salicylate.

Occasionally the symptoms of rheumatic fever are not controlled by salicylates. This, however, is quite unusual, and when no response is observed one should always suspect an error in diagnosis. Furthermore, the relief produced in rheumatic fever by salicylates does not always connote a cure of the disease. In many cases, particularly in children, some activity of the disease persists in the heart in the form of rheumatic carditis, and unless this is recognized severe cardiac damage may ensue.

Patients who show a gastric susceptibility to salicylates may tolerate rectal administration of from 120 to 180 cc. of a 2 per cent solution of sodium salicylate (10 grains in 1 ounce of water) two or three times a day. Intravenous injection of the salicylates has been advocated by some but possesses no advantage over simpler methods of administration.

In addition to the salicylates there are several other drugs which have achieved more or less popularity in the treatment of rheumatic fever. Among these are cinchophen and neocinchophen. The latter is less toxic than the former and for that reason is usually preferred. The physiologic effect of the cinchophen derivatives is similar to that of the salicylates. The dosage is about the same as that for the salicylates, from 1 to 1.3 Gm. (15 to 20 grains) every three or four hours. The toxic manifestations of cinchophen are urticaria and jaundice. In cases of severe intoxication a fatal acute yellow atrophy of the liver may develop. For this reason I feel that cinchophen and its derivatives should not be used for the treatment of rheumatic fever except when other remedies fail. When it is administered, the patient should be watched closely for jaundice and gastrointestinal symptoms.

Aminopyrine is another drug that can be used with striking effect in the treatment of rheumatic fever, and it acts more promptly in much smaller doses. It may be administered in doses of from 0.3 to 0.5 Gm. (5 to 7½ grains) from four to six times a day. After the symptoms have been ameliorated, the dosage is reduced to half the previous amount. When aminopyrine is used, the possibility of an idiosyncrasy to the drug must be borne constantly in mind. During the last few years a number of reports of cases of granulocytopenia following the use of aminopyrine have appeared in the medical literature. For this reason the leukocyte count of patients who are receiving the drug must be carefully followed. If the white count drops to four or five thousand, the drug should be immediately discontinued.

Morphine sulfate from 10 to 15 mg. (one-sixth to one-fourth grain) or codeine phosphate 30 mg. (one-half grain) may be administered either orally or by hypodermic injection for the immediate relief of pain.

In cases in which the physical examination and the electrocardiogram indicate severe cardiac damage, digitalis in some form will probably be necessary, especially for patients who show tachycardia or arrhythmia. Digitalis can usually be administered by mouth, and preferably in the form of the powdered leaf as a pill or

capsule. For adults the initial dose should be 0.5 Gm. (7½ grains), to be repeated in four hours and usually again four hours later, a total of 1.5 Gm. (22½ grains) in the first twelve hour period. After this, 0.1 Gm. (1½ grains) three times a day should be given until a therapeutic effect or some evidence of toxicity results. It is, of course, important that whatever digitalis is used should be of standard pharmacopeial activity as determined by biologic test. Digitalis is contraindicated for those patients whose electrocardiogram shows evidence of heart block.

The dosage of digitalis for children should be only slightly less than that for adults.

Treatment of Complications.—Detailed discussion of the various complications of rheumatic fever would carry us beyond the scope of this article. In patients in whom cardiac decompensation with edema develops digitalis therapy may have to be supplemented by the use of diuretics, such as theobromine 0.5 to 1 Gm. (7½ to 15 grains) or theophylline 0.3 to 0.5 Gm. (5 to 7½ grains). An even more effective diuretic is mercupurin administered intravenously in doses of 1 to 2 cc. in adults and 0.5 cc. in children. In case of pleurisy or pericarditis with effusion, thoracentesis may be necessary if there is an excessive amount of fluid. In advanced cardiac decompensation with cyanosis, administration of oxygen through a nasal catheter or, better still, by means of the oxygen tent is a valuable measure not only for giving comfort to the patient but also in correcting faulty ventilation in the lungs.

Treatment During Convalescence.—The duration of convalescence will be roughly proportional to the length and severity of the illness. The after-care of the rheumatic fever patient is of the greatest importance, the main problem being to avoid relapses and further recurrences of the disease. After antipyretics have been withdrawn, the patient should remain in bed for two or three weeks after all symptoms of infection have disappeared. At the time the patient first gets out of bed the weight should be normal, the pulse slow and regular, the leukocyte count under 10,000 and the sedimentation rate of the red cells not over 20 or 25.

The anemia that follows acute rheumatism in children will require particular attention during convalescence, and for this chief reliance should be placed on the use of arsenic, iron and the ultraviolet rays. Solution of potassium arsenite 0.065 cc. (1 minim, increased to 5 minims or 0.32 cc. three times a day) is helpful. Reduced iron 0.6 Gm. (10 grains) three times a day and iron and ammonium citrate 0.5 Gm. (7½ grains) are the least irritating of the various iron products. Some physicians prefer to administer iron and arsenic intravenously in the form of iron cacodylate.

Particular care must be taken to avoid strain to the heart. The opinion is now generally held among students of rheumatism that in cases of cardiac involvement the severity of the heart lesions will be much less in those treated by rest than in those not so treated. To prevent chronic rheumatic disease of the valves or muscle of the heart the patient must be kept at rest as much as possible for several months, abstaining from emotional excitement and violent exercise of all kinds. It is often difficult to enforce sufficient rest on these patients, particularly among children and the less intelligent classes. In the case of children, the proper enforcement of rest will depend largely on the intelligence and cooperation of the mother.

CONVALESCENT HOMES

For the subacute phases of rheumatic fever an important part of modern therapy is sanatorium treatment. Some of the larger cities in the United States now have institutional facilities for the care of children who are in the subacute, chronic or convalescent stage of the disease. Rest, sunlight, regulated life, adequate diet and medical supervision are the major advantages of this form of treatment. Experience shows that rheumatic children do well in these convalescent homes, though just what the end results of such institutional care may be is a different question and a more difficult one to decide. In England, Campbell and Warner [8] have published statistics to show that they are favorable. McCulloch,[9] however, from a careful analysis of several hundred children, found that, although the incidence of relapses was greatly reduced during sanatorium treatment, the number of recurrences subsequent to sanatorium care was actually greater among children sent to sanatoriums than it was for children who were allowed to remain at home.

PREVENTIVE MEASURES

The well known tendency of rheumatic fever to recur renders preventive treatment one of the most important aspects of therapy. Once a child has rheumatic fever, there is no sure way of preventing cardiac damage. However, in many cases the amount of damage inflicted by the first attack is minimal and can be completely outgrown if the after-care of the patient is properly controlled. With each recurring attack of rheumatism the injury to the valves and heart muscle is increased. The physician, therefore, is not doing his full duty if he does not make every effort to prevent these recurrences.

Focal Infection.—In view of the close association of rheumatic fever with tonsillitis and other infections of the upper respiratory tract, careful investigation should be made for focal infection in this region. Tonsils showing any evidence of disease should be removed promptly. Indeed, many physicians make it a rule to have the tonsils removed in every case of rheumatic fever, regardless of their appearance. However, the removal of tonsils provides no guaranty against subsequent attacks of rheumatism. Kaiser [10] has analyzed a large group of school children regarding the effect of tonsillectomy on the incidence of rheumatic fever. In this study he showed that about one third more children had their first attack of rheumatism when their tonsils were in than those whose tonsils were out. Kaiser also found that the fatality rate of rheumatic fever was nearly 50 per cent less in children whose tonsils had been removed before the initial attack. However, Ingerman and Wilson [11] found very little difference between tonsillectomized and nontonsillectomized children. In the former group 76 per cent showed recurrences of rheumatism; in the control group 80 per cent showed recurrences. Swift sums the problem up very well when he says that "while the few available statistics do not show any great advantage from tonsillectomy from either the prophylactic or the curative

8. Campbell, Maurice, and Warner, E. C.: A Study of Rheumatic Disease in Children, Lancet **1**:61 (Jan. 11) 1930.

9. McCulloch, Hugh: Rheumatic Heart Disease: Its Importance as a Disease of Children, J. A. M. A. **90**:2073 (June 30) 1928.

10. Kaiser, A. D.: Children's Tonsils In or Out, Philadelphia, J. B. Lippincott Company, 1932; Factors That Influence Rheumatic Disease in Children, reprinted with additions, from J. A. M. A. **103**:886 (Sept. 22) 1934.

11. Ingerman, Eugenia, and Wilson, May G.: Rheumatism: Its Manifestations in Childhood Today, J. A. M. A. **82**:759 (March 8) 1924.

standpoint, the figures are at present too meager to permit a final judgment, and it is probably best to give the patient the benefit of the doubt."

The sinuses and teeth should also be investigated for possible infection. Most important of all is the prevention of acute pharyngitis and coryza. Children with a tendency to rheumatism should be carefully protected against exposure to cold and dampness. Sleeping in wet clothing or getting chilled when fatigued predisposes to respiratory infection with possible rheumatic sequelae.

Climate.—Recent studies have shown that climate plays an important part in the incidence and recurrence of rheumatic fever. Coburn [12] has found that when patients with active rheumatic disease are transferred to Puerto Rico they remain free from infections of the upper respiratory tract, and all manifestations of rheumatism subside. However, when these children return to a northern climate many of them again contract respiratory infections, which in most incidences are followed by the reappearance of rheumatism.

The logical method of preventing recurrences of rheumatism would be to transport rheumatic children to the tropics and keep them there through the cold season, but for economic reasons such a solution is not generally practicable.

Prophylactic Vaccination.—For children who cannot have the advantages of a tropical climate, prophylactic inoculations with streptococcus vaccines are well worth trying. Wilson and Swift found that rheumatic children, vaccinated in the fall and early winter, had fewer relapses than a control group. This immunity, however, was not adequate two years later. In my experience, streptococcus vaccine must be given every year, preferably during the winter and spring months, if adequate protection is to be secured.

Personal Hygiene.—Numerous studies have shown that rheumatic fever is a disease of the underprivileged. For this reason the rheumatic child should have the benefit of the best personal hygiene. This would include sanitary housing, warm clothing, plenty of outdoor exercise, sunlight and nutritious food. The studies of Rinehart [13] on the relation of vitamin C to rheumatic fever have suggested the possibility that a vitamin C deficiency might be a factor in the etiology of the disease. However, the administration of vitamin C in large amounts does not appear to shorten the disease or to prevent relapses. The whole subject of vitamin therapy in rheumatism is still in the investigative stage.

Chemotherapy.—Coburn and Moore [14] have recently published an interesting study on the value of sulfanilamide in the prevention of rheumatic fever. Rheumatic children were given maintenance doses of the drug (about 2 Gm. daily) over a period of months and observed with respect to the incidence of hemolytic streptococcus infections and recurrences of rheumatic fever. No toxic effects from the drug were observed. Only one of the twenty-six patients so treated contracted an infection with hemolytic streptococci in the throat flora and only one of the twenty-six highly susceptible rheumatic children developed active rheumatism. However, sulfanilamide administered to rheumatic subjects after the onset of streptococcic throat infections did not prevent rheumatic recrudescences. This important contribution to the prophylaxis of rheumatic fever seems to offer real promise as a practical measure of preventing recurring attacks of the disease.

33 East Sixty-First Street.

12. Coburn, A. F.: The Factor of Infection in the Rheumatic State, Baltimore, Williams & Wilkins Company, 1931.
13. Rinehart, J. F.; Connor, C. L., and Mettier, S. R.: Further Observations on Pathologic Similarities Between Experimental Scurvy Combined with Infection and Rheumatic Fever, J. Exper. Med. **59**: 97 (Jan.) 1934.
14. Coburn, A. F., and Moore, L. V.: The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, with Especial Reference to Rheumatic Fever, J. Clin. Investigation **18**: 147 (Jan.) 1939.

CONFERENCES ON THERAPY

ROUTES OF ADMINISTRATION OF DRUGS

NOTE.—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors.

DR. HARRY GOLD: The conference this morning is to deal with the routes of administration of drugs. We might do well to confine the discussion to drugs employed for their systemic action. There is hardly a tissue barrier in the body which is not used at one time or another for the transport of a drug into the circulation—the small intestine, the sublingual tissues, the rectal mucous membrane, the intact skin, the subcutaneous tissue, the muscle, the nasal mucosa, the vaginal mucous membrane and the spinal canal. Sometimes we get around all barriers and put the drug directly into the circulation, intravenously, intra-arterially or intracardially.

All factors being equal, I think we should probably agree that the oral route is the method of choice for the administration of drugs, as it is for the administration of food. The only trouble is that not all factors are equal, and there are circumstances under which it is desirable, or even imperative, to use some method other than the oral route. If one departs from the oral administration of a drug, one ought to have a pretty good reason for doing so, and I think that the general practice in that respect can be divided into three classes:

In the first class the validity of parenteral administration is supplied by common sense. I think it is nothing more than that. One does not give the drug by mouth because the patient is unconscious, because he vomits, because he will not cooperate or because an emergency exists and one cannot wait for absorption.

In the second class, the parenteral administration of drugs depends on the results of sound pharmacologic experiments. There are innumerable examples in this class: One gives epinephrine by injection and not by mouth for very good and sufficient reasons based on pharmacologic facts; similarly for pituitary extracts by injection and also calcium salts, usually by intravenous injection. Bismuth subsalicylate in the treatment of syphilis is given by intramuscular injection, and not by mouth, because the object of treatment is to obtain a slow stream of bismuth entering the circulation over periods of weeks, sometimes months, and there is no other way to achieve that. Again, morphine sulfate is usually administered by subcutaneous injection rather than by mouth, and perhaps the reason for that is well known to you. It is relatively slowly absorbed from the intestinal tract; the analgesic action is brief, the general depressant action is long. To secure sufficient

analgesia by the oral route requires doses which cause unnecessarily prolonged depression.

Those, then, are the first two classes. The first depends on common sense and the second on pharmacologic experiments. There is a third class of practice which possesses no validity at all on the basis of our present knowledge. I now refer to the very widespread practice of giving common drugs by injection when the effective, less dangerous and less costly oral route is available. Not a vestige of evidence exists at the present time to justify the courses of injections of iron, cacodylate, iodides, bromides, salicylates and a host of other agents, frequently so given. A very large proprietary industry thrives on the doctor's predilection for the injection of agents that can be satisfactorily given by mouth.

When the question arises as to whether one should give a drug orally or intravenously when it can be given by either route, there is a tendency to assume that nothing more is involved than the matter of convenience of administration or speed of action. There are some important fundamental factors involved here which have received but little consideration. I want to mention one of them. If an animal is given a dose of atropine sulfate, say 50 mg. per kilogram, at one time intravenously, it will die almost immediately from circulatory collapse. If one gives the animal atropine sulfate much more slowly by subcutaneous injection, by mouth or even by repeated small intravenous injections, it requires a very much larger dose to kill the animal; but more than that, death takes place by a different mechanism. It dies now not from circulatory collapse at all but from paralysis of the myoneural junctions in the muscles of respiration. Another illustration with similar significance: If one injects a small dose of quinidine sulfate intravenously, one produces marked changes in the heart as shown in the electrocardiogram. However, one can give very much larger doses of quinidine by oral administration or by intramuscular injection, and one can kill the animal by these larger doses, producing convulsions, however, without any changes in the electrocardiogram. In short, it is not only a matter of convenience or speed of action. The pattern of action of a drug is not necessarily the same when given orally as when given intravenously. The difference is due to the difference in the concentration of the drugs in the circulation in the two cases, since the distribution of the drug to various organs of the body depends in a large measure on the concentration in the blood stream.

How these matters stand in clinical therapy at the present time one can hardly surmise, for they have not been explored.

We cannot do much more this morning than to thrash out the pros and cons of the administration of some of the more common and important drugs that are used in therapeutics. Dr. Eggleston will lead the discussion.

THE CARDIAC DRUGS

DR. CARY EGGLESTON: In the problems facing us in the administration of cardiac drugs, all of those touched on by Dr. Gold are represented. However, we can concentrate our attention, I think, on certain of those problems because of their greater frequency and greater importance.

It is my purpose not to discuss the actions of digitalis, or even the dosage of digitalis or of its various bodies and representatives, but to discuss the administration of these cardiac drugs as we face the problems in the treatment of cardiac failure.

Of course, the digitalis group heads the list when we speak of cardiac drugs. Here there is no question that the route of choice, the route *par excellence*, is the oral route. In this connection we have to consider a number of problems: first the availability of the drug, then its uniformity, potency and absorbability, the uniformity as well as the rate of absorption, the duration of action, the cost, and finally minor problems such as the side actions of the drug and the ease of administration. But practically all of these desiderata can be met in the case of digitalis by the simplest representative of the entire group, the powdered leaf. This is available, inexpensive and readily absorbed, it is today of fairly uniform potency and high activity, the rate of absorption is satisfactory for the majority of patients, it is easily administered, and the duration of its action is well within the limits of desirability. For the oral administration of digitalis, as I have said, the powdered leaf is apparently the most desirable of all preparations as yet available. The dose is not too large. It can be administered in tablet form or in capsules or may be given as powders, although that is inconvenient. Pills are used, but much less commonly than the tablet or capsule. The powder may even be incorporated in suppositories, which I shall discuss in a few moments. The powdered leaf has the advantage of keeping well, although the tincture is not bad as to keeping properties. The dose is small in bulk but not too small for easy handling. The powdered leaf, once standardized, can be administered in terms either of weight or of its biologic activity. These, therefore, lead to the choice of the powdered leaf as the form of primary value. When given by mouth, absorption is complete in about six hours. Its duration of action varies, of course, with different individuals and with different preparations of the leaf and under circumstances some of which are not well known; but in general the duration of action is sufficiently long so that doses do not have to be repeated too frequently. It is usually satisfactory for maintenance purposes to administer a dose but once daily. This does not embarrass the patient and he is not as likely to forget it as he would be if he had to take repeated doses.

The powdered leaf can generally be taken by patients even in the presence of the minor degrees of nausea which are occasionally associated with acute congestive heart failure, although at times this constitutes a barrier. There are certain psychic barriers which we must consider in the administration of digitalis orally. Most frequently they occur in a patient to whom digitalis has been administered unwisely so that nausea and vomiting have been induced. Sometimes such a patient believes himself utterly incapable of taking digitalis in any form, and occasionally this constitutes a real barrier to the administration of the powdered leaf, the tincture or any other preparation with a name implying digitalis with which the patient has been familiar. We then occasionally have to resort to subterfuges and employ other preparations, of which I shall speak briefly.

Psychic nausea or vomiting usually can be avoided by administering the powdered leaf by rectum in the form of a suppository or as the galenic preparations of the powdered leaf, such as the tincture. The dose by rectum and the rate of absorption are not materially

different from those by mouth. There may be minor variations. The rectal dose will perhaps have to be a little larger and occasionally a little less; however, this varies in individuals and is not a matter of major importance. Instead of resorting to the rectal route of administration we may use some of the newer more or less purified glucosides of digitalis or of its congeners, and for this purpose urgimin, which is a mixture of the two active glucosides of squill, may be employed satisfactorily. It has the advantage of carrying no implication in its name that it is related to digitalis.

Amorphous gitalin, which was introduced under the trade name verodigen, may also be employed.

You may wonder why we do not resort immediately to parenteral methods of administration to avoid this psychic nausea or vomiting. This is primarily because we can avoid it without having to resort to the parenteral methods, and these methods with one exception are relatively unsatisfactory for the administration of digitalis.

The subcutaneous route should never be employed, I believe, primarily because all of the digitalis bodies that are potent are intensely irritating to the subcutaneous tissues; I have seen more than one instance in which they have been so given by error or intent and have resulted in very severe cellulitis or even in local necrosis of the tissues. Along with these inflammatory reactions the patients have suffered rather intense pain, often requiring morphine for relief.

The intramuscular administration of digitalis bodies is an available route but one which is frequently abused, in my opinion. It is most commonly used in the hope of hastening absorption or of making sure of digitalization. I believe that this is a genuine error because in my experience the digitalis bodies are neither as uniformly nor as rapidly absorbed from intramuscular administration as they are after oral administration. Intramuscular injection produces much less local irritation than subcutaneous administration, but with some patients it is significant. Occasionally for unconscious patients and under other circumstances it may be necessary or desirable to resort to intramuscular injection. For this purpose we may use such partially purified preparations as digitan or digifoline, or we may resort to the strophanthins. Frankly, I have found very little need for intramuscular administration.

Intravenous administration, however, constitutes a method of great value in a very limited number of cases. There is only one agent which in my personal experience is sufficiently trustworthy and well understood to permit me to recommend it, and that is crystalline strophanthin gratus (ouabain). One may also employ the amorphous strophanthins, but these are less active and appear to be less stable, and I myself have not found them as desirable as ouabain. The indications for the resort to intravenous ouabain therapy I believe are summed up by saying that it may be valuable when one is faced with a grave emergency and the patient has not previously been receiving digitalis. The total dose of ouabain for this purpose is approximately 1 mg. for effective digitalization. This total dose had best not be given in a single administration. It is wiser to give half of that dose, 0.5 mg., initially. The action is prompt. The injection should be reasonably slow and in sufficient dilution, say 10 cc. About five or ten minutes should be allowed for the injection. The actions will be manifest, if they are to appear, within fifteen to thirty minutes and will be fairly well developed by the end of an hour or possibly two, when one can judge effects sufficiently accurately so that subsequent fractions of the total dose of 1 mg. may be added at intervals of one-half to one or two hours, to secure adequate digitalization.

The objections to the intravenous use of ouabain, aside from those mentioned by Dr. Gold, are that it does not seem justifiable to continue treatment by this route; the action is fairly brief, and to maintain digitalization it would be necessary to give two or three doses or more in twenty-four hours. This is scarcely justifiable except as an emergency measure, and even then one should begin to administer digitalis by the intestinal tract, by mouth or by rectum so as to pick up and maintain action.

The next group of drugs of importance in heart disease is the diuretics, and these can be passed over briefly as to their routes of administration. The various members of the purine family, theophylline, theobromine with sodium salicylate, theocalcin and the like are all best administered by mouth for the purpose of producing diuresis. None of these are too well borne by the gastrointestinal tract, and nausea and vomiting may result and constitute a problem in their further administration. Theophylline with ethylene diamine (aminophylline) is occasionally of some value intravenously for the specific purpose of checking Cheyne-Stokes respiration or cardiac asthma, when its action is exceedingly prompt. Other diuretics in this group need not be mentioned.

The mercurials constitute the most important group of present day diuretics, and these are best administered intravenously to avoid their local irritant actions. They are quite irritant to the local tissues when injected subcutaneously. When the mercurials, either mercupurin or salyrgan (mersalyl), contain an added amount of theophylline (mercupurin is a combination of mercurin with theophylline), their local irritant effects are materially reduced, and they may, if necessity dictates, be administered intramuscularly. The mercurial fraction of mercupurin as well as mersalyl can be administered successfully by suppository, but in many instances this produces so much local discomfort in the rectum that the patient is unwilling to continue their use. Hypertonic solution of dextrose is scarcely a drug, and it must be administered intravenously for diuretic purposes. Urea is administered by mouth. Other diuretics are of small value.

Dr. Gold has saved me a good deal of time in discussing the question of the sedatives and hypnotics. He has already spoken of morphine, which is I believe the most important sedative for the cardiac patient, and I quite agree with him that it should be administered subcutaneously. Substitutes for morphine are available, such as dilaudid, pantopon and codeine. My own experience leads me to favor morphine over all these substitutes. Other sedatives are primarily administered through the gastrointestinal tract and embrace such agents as hydrated chloral, which is far too irritant and which has too large a dose, to permit of its being administered in any other way than through the digestive tract. The bromides and the soluble barbiturates may both be administered intramuscularly. Paraldehyde should be given by rectum or by mouth.

The nitrites should also be given orally or by inhalation. If orally the best is glyceryl trinitrate and its administration is best under the tongue, whence it is absorbed with great rapidity and effectiveness. Amyl

nitrite is, of course, administered by inhalation. It smells bad to many and its administration is not readily controllable in any event.

Quinine and quinidine are ordinarily most conveniently administered orally. They may on occasion be administered intravenously but very slowly and in very dilute solution.

One final preparation deserves mention, and that is acetyl-beta-methylcholine, which is administered subcutaneously and is resorted to only as an emergency remedy for the checking of a paroxysm of auricular tachycardia.

Dr. Gold: We shall reserve discussion until the latter part of the conference. Dr. Shorr, will you discuss the modes of administration of the sex hormones?

SEX HORMONE PREPARATIONS

Dr. Ephraim Shorr: Since it is the intention in this conference to discuss not the therapeutic indications for the use of the sex hormones but merely the choice of modes of administration, I shall confine what I have to say to the latter aspect.

There are two groups of hormones which are employed in dealing with problems of sex physiology in the human being.

The first comprises those whose purpose is to stimulate the gonads into activity when function is either absent or subnormal. These are called gonadotropic hormones and are obtained from three sources.

The first source is the anterior pituitary gland, from which an extract with definite gonadotropic activity in animals has been prepared. It is protein-like in character and still crude from the chemical point of view. It is meant for subcutaneous administration and is practically always employed by this route.

The second type of gonadotropic preparation is obtained from the serum of pregnant mares. It is available in a much more purified state than the gonadotropic principle from the anterior pituitary. This hormone may be given subcutaneously, intramuscularly and intravenously. This last route is recommended because it brings the hormone in considerable concentrations into the blood stream in a short time and may prove the most economical way of bringing about an effect.

When mare serum hormone is given subcutaneously or intramuscularly there appears to be little local or general reaction, so that large doses can be given with safety. If the intravenous route is employed, an effort should be made to ascertain whether or not any undue sensitivity exists in the individual patient. This can be done by skin testing. I have encountered a number of reactions in patients even though skin tests were negative, but they were fortunately mild. They consisted of a flush lasting about five minutes, and in some instances urticaria.

The third type of gonadotropic hormone is derived from pregnancy urine. This is the chorionic gonadotropin and is, like the pituitary extract, still too crude to use intravenously. Its use is frequently associated with local reactions which take the form of redness and swelling, or general reactions such as malaise, elevation of temperature and generalized aches and pains. For these reasons it is desirable to start with low doses and to work up gradually to the desired maximum. In this way unpleasant reactions can be avoided. These precautions hold for both pregnancy urinary extracts and extracts of the anterior pituitary.

The second form of therapy is of the substitutional type and consists in the administration of the hormones, elaborated by the gonads when insufficiency exists. Turning first to the secretions of the ovary we find four available. Three belong to the group of estrogens. They are estrone, estradiol and estriol. The first two are suitable for parenteral and oral use and the last for oral use.

The most common mode of administration of estrone and estradiol is intramuscular. The reasons for this lie in loss of potency when administered orally. Both these compounds lose anywhere from 90 to 95 per cent of their activity when given by mouth. One can, of course, take this loss of efficiency into account and correct for it. When this is done the full therapeutic dose may be given by mouth. At the moment it is a matter of economics and awaits an improvement in chemical methods which will reduce the cost of these preparations.

Estriol (theelol) is also effective by mouth but the amounts of the present commercial preparations that are feasible to use are too small to benefit most of the patients with a menopausal syndrome. More recently several workers have implanted crystals of estradiol with very beneficial effects. The hormone is slowly absorbed and a small amount lasts a long time. One disadvantage to be considered as regards this method of administration is the possibility that its use for patients with intact uteri may bring about continued hyperplasia of the endometrium which may lead to bleeding difficult to control.

The estrogens are very useful in the form of vaginal pessaries in the treatment of local conditions such as senile and gonorrheal vaginitis, when the therapeutic aim is not the general effect of the hormone but a local action on the vaginal mucosa, to induce hypertrophy and resistance to infection.

The fourth hormone elaborated by the ovary is the progestational one, progesterone. It is given intramuscularly in oil. A derivative with progesterone-like action, pregneninolone, is available for use by mouth, and gives promise of being effective by this route.

The androgenic hormones, of which the most generally used form is testosterone propionate, are at present chiefly employed in an oily vehicle by the intramuscular route. They apparently lose even more of their effectiveness when given by mouth, so that the oral route is out of the question at present. A derivative, methyl testosterone, may prove to have a greater oral efficiency, but the factor has not as yet been worked out.

More and more, the advantages of pellets implanted subcutaneously are becoming recognized. This mode of administration has the disadvantage of necessitating a minor surgical procedure, but it has the great advantages of prolonged and sustained action and economy.

I should like to mention briefly a synthetic estrogen, stilbestrol, which is inexpensive, highly active, and loses but little of its efficiency when given by mouth. Its use in this clinic has, however, been associated with so many toxic effects that we consider it potentially dangerous and undesirable for human use, certainly until more is known of the nature of the side reactions.

Dr. Gold: Dr. Washington, will you discuss these problems from the standpoint of pediatric practice?

ADMINISTRATION OF DRUGS TO CHILDREN

Dr. John A. Washington: In pediatrics we use about the same drugs that are used in adult medicine. Any differences lie in methods of administration and

of course in dosage. Differences in administration are based less on physiologic considerations than on practical considerations having to do with the ability of the patient to swallow or retain the drug. In the first place, we are not usually able to give rectal instillations or suppositories to infants and small children because these patients will not retain them. By strapping the buttocks with adhesive tape it is possible to make use of quickly absorbed drugs, such as avertin with amylene hydrate, with some degree of success, but even with this strapping some loss of the instillation usually occurs. The oral route therefore must be heavily relied on.

Here there are certain limitations peculiar to pediatrics. In the first place, we can't use pills for infants and small children. Infants will usually spit them out. Small children will chew them up, which usually results in more or less spitting when the taste is appreciated. Consequently, medicines for these patients must be in a dissolved form or at least suspended in a liquid. Infants will swallow unpleasant tasting liquids to a surprising extent.

However, this does not always happen. It is when they begin resisting that our difficulties begin. By holding the nose an experienced nurse can usually get almost any dose down. In the home, however, one can never be sure how much a sympathizing mother will manage to get into a young child. Besides the danger of a struggling child's not getting the drug down, there is always the danger of his aspirating some. If the substance is oily and if the performance is repeated often, the danger of lipoid pneumonia developing is very real.

A number of drugs are used both by mouth and hypodermically. Some of the reasons for resorting to the use of a needle can be illustrated by the administration of calcium compounds in infantile tetany. When convulsions are occurring or, even worse, when laryngeal spasm is present, getting calcium and a sedative into the patient is an emergency measure. Most calcium compounds are rapidly enough absorbed after oral administration, but a baby with tetany cannot be counted on to swallow the medicine, and one does not want to increase his spasm by the struggle which accompanies forcing it. I know one experienced pediatrician who prefers to pass a small catheter into the stomach and put a solution of calcium chloride and the sedative through that. The usual procedure, however, is to use a solution of calcium gluconate intramuscularly. This involves no more disturbance than passing a catheter and has an added advantage in that the drug can't be vomited. With the relief of the spasm, which is usually prompt, one can continue the treatment with oral doses.

The technic of administering drugs intravenously is different from that in adult medicine, chiefly in that there are no prominent veins in the antecubital fossae. In the skin of the scalp, however, there are a number of superficial veins which can be entered with surprising ease. To do this one has to shave a patch of the scalp. In the hospital this is done often, more for the administration of fluids of course than of drugs. Babies with diarrhea often receive several infusions a day for a number of days.

Through these veins the newborn babies with acute syphilis can be given their first arsenic injections. When these patients are discharged to the outpatient clinic they are not usually subjected to this scalp-shaving procedure, and intramuscular injections are relied on until veins develop in their antecubital spaces.

I might mention here that the inunction method of giving mercury in congenital syphilis has in many clinics been abandoned, and bismuth injections have been substituted. One good reason for this is that one could never be sure how conscientious the mother might be in giving the rubs.

DISCUSSION OF QUESTIONS

DR. GOLD: The conference is now open to general discussion.

DR. EUGENE F. DU BOIS: I should like to bring out a practical point about the tincture of digitalis, which was the form used about ten years ago. A good many men do not realize the enormous difference between the drop and the minim of a tincture. I think the general practitioner usually considers that they are synonymous when as a matter of fact it takes about 2½ drops of the tincture of digitalis to make 1 minim.

DR. WALTER MODELL: There is a standard minim dropper.

DR. EGGLESTON: That measures the minims but does not drop them. Apparently, there is no standard method for dropping which will secure uniformity in the measurement of an alcoholic preparation. Furthermore, Dr. Du Bois's question brings up a feature of undesirability of the tincture and other fluid preparations of digitalis in that the responsibility for measurement generally devolves on some one in the home who is not trained and rarely can measure accurately, even if provided with measuring utensils.

DR. GEORGE A. SCHUMACHER: I want to ask the conference a question in regard to the use of sedatives for cardiac patients. The problem frequently comes up in the ward of elderly patients with cardiac insufficiency who also have cerebral arteriosclerosis. Such patients are often restless and irritable and hard to control. Sometimes when they are in the oxygen tent they beat on the sides of the tent and try to get out, and we want to keep them at rest as much as possible. We want to keep away from the barbiturates in those cases. We are told that bromide and chloral hydrate are preferable sedatives for those patients, but on the other hand we are also told that chloral hydrate is a rather dangerous myocardial depressant, so we are oftentimes left not knowing what to do.

DR. EGGLESTON: I believe that this idea about chloral hydrate being a dangerous myocardial depressant is rather exaggerated if it is given in reasonably conservative doses and the dosage gaged by the effects and kept at the desired level. When that is done ill effects are very unlikely to occur. When chloral hydrate is combined with bromide its action is sometimes more lasting and the amount to be used can be reduced. Here is a particularly useful field for paraldehyde. Paraldehyde has only two objections: inconvenience of administration on account of its physical properties of taste and smell, and its persistent odor on the breath no matter how administered. These are very minor under circumstances such as you have mentioned, and so far as I am aware paraldehyde is virtually nontoxic in sedative doses. We have a patient upstairs now who has been taking between 70 and 130 cc. of paraldehyde in twenty-four hours over a period of several months without any detrimental effects whatever. It is the only thing which keeps him quiet.

DR. GOLD: It might be well for us all to taste a solution of chloral hydrate. It has a very disagreeable taste and it is quite irritant. It behaves like a lini-

ment; in fact, together with some camphor it makes a pretty good liniment. We ought to be sure its taste is well masked with syrup of orange peel and that it is well diluted before giving it. I have seen disaster following chloral hydrate in a case of cerebral hemorrhage in which the bleeding was resumed as the result of the vomiting from an insufficiently diluted solution.

Dr. Eggleston: In dilute form it can be administered by rectum very successfully.

Dr. Ade T. Milhorat: I think that electrophoresis should be mentioned as a mode of administration. That certain substances can be so introduced into the organism is shown by the general systemic effects produced when electrophoresis is applied locally. The term "iontophoresis" is somewhat unfortunate and serves no useful purpose. The principles underlying this method are imperfectly understood, and the methods employed frequently are unsatisfactory and even crude.

Dr. McKeen Cattell: I should like to ask Dr. Eggleston how it happens that ouabain is the glucoside of choice for intravenous administration. It would seem to be at the wrong end of the scale with reference to the rapidity of elimination.

Dr. Eggleston: Perhaps I had better say drug of choice for me. I feel that it probably is the drug of choice in the present state of our knowledge of the glucosides of the digitalis family because it appears to be the one which, being crystalline, is most nearly uniform in its composition and activity, although possibly some of the newer crystalline glucosides derived from digitalis, such as digitoxin (digitaline nativelle) may supplant it. However, most of those are not as readily soluble, or not as soluble in water or in physiologic solution of sodium chloride, as is ouabain. Finally, our experience with ouabain has been very extensive, so that we have come to know both its indications and its limitations, I believe, much more satisfactorily and thoroughly than is true of any other of the digitalis glucosides. The other strophanthins are for the most part impure and amorphous, and unless they are biologically assayed they cannot be used with the same sense of assurance and the same degree of reasonable safety as ouabain can. I might add as a matter of interest for the students that I have not given nor have I seen given in my services at this hospital or at Bellevue Hospital a single intravenous administration of ouabain in several years, so it is not very necessary.

Dr. Cattell: Perhaps this is an appropriate place to emphasize an elementary principle which in certain instances determines the route of administration of drugs. In general, the intensity of drug action is proportional to the concentration attained in the blood stream and this in turn is dependent on the relationship between the rate of absorption and the speed of elimination. The dose of substances such as the digitalis glucosides or barbital, which are eliminated slowly, is of the same order regardless of the route of administration; on the other hand, when elimination is rapid, such as is the case, for example, with epinephrine and acetylcholine, an effective concentration in the blood can be attained only by a route which introduces the drug into the circulation rapidly.

Dr. Janet Travell: I should like to comment on Dr. Eggleston's statement that glyceryl trinitrate is absorbed with great rapidity when placed under the tongue.

It has long been recognized that some drugs, especially morphine, are absorbed faster when held in the mouth than when swallowed. However, there seems to be no clear statement in the literature as to what types of drugs can be absorbed better from the mouth than from other parts of the gastrointestinal tract. By "better" I mean that absorption may be either faster or more complete.

One of the digitalis bodies, strophanthin, has been studied in this respect. Some years ago Dr. Eggleston reported that strophanthin, which is poorly and irregularly absorbed when given orally, also produced no demonstrable effects on patients when placed under the tongue. However, we do not know the reasons for the very poor sublingual and gastrointestinal absorption of this glucoside.

There is one class of compounds, namely the alkaloids, which experiments in our laboratory have indicated should be absorbed much faster when retained in the mouth than when swallowed. We have shown that the hydrogen ion concentration plays an important role in the absorption of alkaloids from the gastrointestinal tract. A high degree of gastric acidity will completely prevent their absorption from the stomach, whereas absorption occurs rapidly in the nearly neutral intestinal juices. If, however, the p_H of the gastric juice is rendered neutral or slightly alkaline, absorption of alkaloids then occurs about as rapidly from the stomach as from the soft subcutaneous tissues. The high p_H of the saliva would favor prompt and rapid absorption of an alkaloid from the oral mucous membrane, whereas after swallowing the drug a delay in the appearance of effects would occur until it had reached the small intestine.

The influence of the p_H on the absorption of alkaloids from membranes and surfaces other than the gastrointestinal mucosa has been known a long time, but it might well be emphasized here. For example, alkalization of a solution of cocaine increases the rate of penetration of this anesthetic. Nicotine poisoning results from the application of a solution of nicotine base to the skin, but poisoning does not occur when the sulfate is similarly applied. Thus the acidity or alkalinity of a solution, which determines the amount of the free alkaloidal base present, is a factor of practical importance in the absorption of alkaloids. This probably applies to all routes of administration.

Dr. Cattell: Solution of posterior pituitary is a familiar example of a drug which is ineffective when given orally, owing to proteolytic digestion in the gastrointestinal tract, but which is readily absorbed by the nasal mucous membrane.

Dr. Gold: May I ask Dr. Eggleston a question in regard to rectal administration? It is said that rectal administration of digitalis is more effective than oral administration because when given by rectum the material escapes the destructive action of the liver. I have reference particularly to the study which Robert Levy made some years ago, in which he took issue with that notion.

Dr. Eggleston: Yes, I think Dr. Levy's studies and the experiences of many of us have shown that if such destruction does occur, it is of no material importance. Certainly digitalis is absorbed by rectum with a very reasonable approach to the efficiency with which it is absorbed by mouth, and absorption does not vary materially. I would take issue with the suggestion that it is more effective when administered by rectum than when administered by mouth; the evidence points to the need for administering somewhat larger doses by rectum

than by mouth to accomplish the same effect, so that I doubt if absorption is better by rectum than by mouth. There does not seem to be much evidence for destruction by liver when the dose is administered orally. It is probable that a part of that administered by rectum passes through the liver too, if not the major portion of it. We do not know, but Levy's experiments, which were designed to show the site of absorption, in which he utilized a radiocontrast substance, showed that administration by rectum of solutions of digitalis was followed by their rapid passage into the upper reaches of the rectum, from which absorption carries them through the liver rather than through the shunt that occurs from the extreme lower end of the rectum.

SUMMARY

DR. GOLD: I may now briefly summarize some of the chief points which issue from the discussion this morning. The oral route is the method of choice and parenteral administration should not be used without satisfactory proof of special needs. There is experimental indication that the distribution of a drug, and therefore the pattern of its action, is not necessarily the same by oral as by intravenous injection, and this might influence therapeutic results. Therefore, more than the matter of convenience and speed of action is involved in parenteral administration. The subject is in need of clinical study.

Most of the drugs used in the treatment of heart failure are generally given by oral administration: digitalis, the xanthines as diuretics, the nitrites, quinidine and the hypnotics. Intravenous digitalis medication is rarely necessary, and in that case ouabain is preferable. The digitalis preparations are too irritant for subcutaneous injection. The mercurial diuretics are best given by the intravenous route. Aminophylline has special advantages by intravenous injection in Cheyne-Stokes respiration. Acetyl-beta-methylcholine is best given by subcutaneous injection.

It is suggested that the danger of chloral hydrate as a sedative for cardiac patients is exaggerated. But, since it is quite irritant, it must be well diluted and its disagreeable taste masked for oral administration. Paraldehyde is regarded as a particularly safe sedative for cardiac patients.

The sex hormones (gonadotropic hormones, estrogens, progesterone, androgens) are at present employed mostly by parenteral routes, for reasons of efficacy and economy. The loss of potency is too great by the oral route. Only one is sufficiently pure for intravenous use, namely the one obtained from mare serum. The others are given subcutaneously or intramuscularly.

The special problems of administration of drugs to children were discussed. Liquid preparations and the parenteral route are particularly applicable to the sick infant who either can not or will not take medicines in other forms.

The recent studies on the role of the p_H on the absorption of alkaloids were discussed. These drugs penetrate tissue barriers much more quickly when the medium is strongly alkaline than when it is acid.

Attention was called to the nasal mucosa as an absorbing medium for drugs which are not effective by the oral route.

The view that drugs absorbed from the rectum act differently from those given by mouth because the former escape the action of the liver is shown to be incorrect. The evidence is that most of the absorption takes place in the upper portion of the rectum which drains into the portal circulation.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE FIVE SEROBACTERINS NAMED IN THE APPENDED REPORT WERE OMITTED FROM THE 1939 EDITION OF NEW AND NONOFFICIAL REMEDIES IN ACCORDANCE WITH ACTION TAKEN BY THE COUNCIL IN 1938. FOLLOWING ITS CUSTOMARY PROCEDURE, THE COUNCIL TRANSMITTED TO SHARP & DOHME THE STATEMENT EXPLAINING THE OMISSION OF THE PREPARATIONS FROM NEW AND NONOFFICIAL REMEDIES. ON DEC. 28, 1938, THE FIRM ACKNOWLEDGED RECEIPT OF THE COUNCIL'S REPORT AND REQUESTED A FURTHER POSTPONEMENT OF COUNCIL ACTION FOR SIX MONTHS TO AWAIT THE OUTCOME OF CERTAIN EXPERIMENTS DESIGNED TO PROVIDE ADDITIONAL INFORMATION WITH WHICH TO EVALUATE THE SEROBACTERINS. THE FIRM ASSURED THE COUNCIL THAT DURING THIS PERIOD ALL FORMS OF PROMOTIONAL ADVERTISING ACTIVITIES WOULD BE DISCONTINUED. SUBSEQUENTLY, UNDER DATE OF OCT. 12, 1939, SHARP & DOHME REQUESTED A FURTHER EXTENSION OF THE PERIOD OF ABEYANCE "FOR ONE YEAR FROM THIS DATE" WITH THE UNDERSTANDING THAT NO PROMOTION OF THE SEROBACTERINS "EITHER IN MEDICAL JOURNAL ADVERTISING OR IN BROADSIDES TO PHYSICIANS" WOULD BE MADE.

SINCE THE SEROBACTERINS HAVE BEEN ACTIVELY MARKETED FOR MORE THAN A QUARTER OF A CENTURY, DURING WHICH TIME ADEQUATE EVIDENCE TO ESTABLISH THEIR THERAPEUTIC VALUE MIGHT WELL HAVE BEEN EXPECTED TO BECOME AVAILABLE, AND BECAUSE AN EXPLANATION OF THE COUNCIL'S DECISION OMITTING THE SEROBACTERINS FROM NEW AND NONOFFICIAL REMEDIES 1939 MAY BE OF INTEREST TO THE MEDICAL PROFESSION, THE COUNCIL AUTHORIZED PUBLICATION OF THE APPENDED REPORT WITHOUT PREJUDICE TO ANY FURTHER CONSIDERATION OF THE FINAL RESULTS OF THE SHARP & DOHME INVESTIGATION WHICH MAY BE DEEMED TO BE NECESSARY.

PAUL NICHOLAS LEECH, Secretary.

SEROBACTERINS-MULFORD (SHARP & DOHME) OMITTED FROM N. N. R.

In 1914 and 1915 the Council accepted certain of the "Serobacterins" which were manufactured by the H. K. Mulford Company, as follows: Acne Serobacterin-Mulford, Cholera Serobacterin-Mulford, Staphylo-Serobacterin-Mulford, Typho-Serobacterin-Mulford and Typho-Serobacterin Mixed-Mulford. The descriptions of these products in New and Nonofficial Remedies, 1938, are preceded by the following statement:

> These products are prepared in the same manner as bacterial vaccines, except that the bacterial suspensions are treated with the serum of an animal which has been immunized to some extent against the species of organism in hand. The serum is then washed from the bacterial bodies by centrifugation and the latter are resuspended in physiological solution of sodium chloride.

It should be noted that the foregoing does not authorize any claims of superiority over nonsensitized vaccine for these serobacterins. In 1937 Sharp & Dohme presented a booklet, "Advantages of Serobacterins in Bacterial Vaccine Therapy," for the Council's consideration as advertising for its accepted products. Some unaccepted "Serobacterins" were mentioned in the text. In general the text gave the impression of having been written with a view to suggesting that "Serobacterins" are better than other well known prophylactic vaccines, that they have a wider field of application and that they offer "a degree of passive immunity during the period of lag or 'negative phase' which precedes the development of active immunity in the use of plain bacterial vaccines." The firm stated that there had been "recent improvements made in the preparation of serobacterins." The illustration in the booklet is typically of the "promotional" type, giving the impression that serobacterins should be used in preference to ordinary bacterial vaccines because the bacterial vaccines do not become effective for from eight to ten days, whereas in the case of the serobacterins the "negative phase" is removed. The Council requested the firm to show evidence that the serobacterins were superior to ordinary vaccines and especially to show what clinical evidence existed to establish this claim for recent improvements. The firm requested that the report be held in abeyance pending accumulation of additional evidence. The Council, following its usual custom acceded to the firm's request with the understanding, agreed to by the firm, that the products were not meanwhile to be actively promoted.

In September 1938 the firm presented data which it stated would aid in the further evaluation of the usefulness of its serobacterins. This was reported to the Council by the referee, who at the same time stated that after consultation with a number of associates who have had special experience in this field he was confirmed in his opinion that the evidence does not favor continued recognition of the preparations by the Council.

The Council therefore omitted from New and Nonofficial Remedies the Serobacterins-Mulford enumerated at the beginning of this report.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, APRIL 13, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

PROTRUDED INTERVERTEBRAL DISK

The concept that a protruded intervertebral disk is the etiologic factor in cases of low back pain and sciatica was evolved as the result of accumulated facts and observations. The contributions of Luschka (1858) on the anatomy and physiology of this structure and the more recent studies of Schmorl, Andrae and their co-workers (1927-1932) on the pathology of the intervertebral disk as seen in their necropsy studies of more than 3,000 spinal columns provide scientific basis for the role assumed by this structure in a number of clinical conditions. The significance of the posterior propulsion of the disk in causing pressure on the contents of the neural canal grew out of the isolated but none the less important and convincing observations of Kocher, Middleton and Teacher, Goldthwaite, Adson, Dandy, Bucy, Stookey and others. Mixter and Barr established the clinical relationship between the protruded nucleus pulposus and certain cases of intractable back pain and sciatica. A number of reports emanating from the Boston surgeons and from the neurologic service of the Mayo Clinic described in detail the clinical picture, the roentgenologic diagnosis with the aid of iodized poppyseed oil, and the results obtained from laminectomy and the removal of the protruded mass. The fascinating clinical story of the disk has been commented on editorially in THE JOURNAL.[1] More detailed information can be obtained from the monograph by Mauric,[2] from the review by Saunders and Inman [3] and from the papers which recently appeared in THE JOURNAL (Dec. 2, 1939).

A new clinical concept which involves a not altogether innocuous diagnostic procedure and a major operation naturally evokes a skeptical attitude. Thus Symonds,[4] in a discussion of Love's paper, stated that it was his impression that the prolapsed intervertebral disk is a rare cause of sciatica and that it is capable of spontaneous repair in most cases. The discrepancy between the figures of Andrae, who found this lesion in 15 per cent of his necropsy studies, and that of the Mayo Clinic for 1935, 1936 and 1937, which amounted to only 1.8 per cent of all the cases treated for low back pain and sciatica, lends support to his argument. Symonds inquires as to the proportion of cases of unilateral sciatica with protein content in the spinal fluid between 40 and 100 mg. in which the prolapsed disk can be demonstrated by the new iodized oil technic. The accuracy of the method, according to Camp,[5] yields a percentage rate of 92.3 of accurate diagnoses, as verified in a series of 210 cases in which operation was performed. The literature on the subject does not contain a statement as to the relationship of the accuracy of the roentgenologic method to the protein content of the spinal fluid. Symonds inquires concerning the clinical grounds which should warrant the injection of 5 cc. of iodized oil into the thecal sac and the ill effects, if any, which may result from such an injection in a negative case. Others can hardly recognize more keenly the drawbacks of the method than the men who employ it. It must, however, be pointed out that much of the accuracy in the diagnosis of this condition has been developed on the basis of the roentgenologic method. In the hands of the men who employed this method most there were the least complications. Iodized poppyseed oil is an ideal contrast substance for the visualization of the spinal subarachnoid space, but it has definite disadvantages in that it is slowly absorbable, is more or less irritating to the meninges and is contraindicated in the presence of inflammatory conditions. It is recommended that the method be employed only when an intraspinal lesion is suspected. The refinement in clin-

1. Protruded Intervertebral Disk, Back Pain and Sciatica, editorial, J. A. M. A. **113**: 1303 (Oct. 1) 1939.
2. Mauric, G.: Le disque intervertebral, Paris, Masson & Cie, 1933.
3. Saunders, J. B. deC. M., and Inman, V. T.: The Intervertebral Disk: A Critical and Collective Review, Internat. Abstr. Surg. **69**: 14, in Surg., Gynec. & Obst., July 1939.
4. Symonds, C. P.: Proc. Roy. Soc. Med. **32**: 1712 (Oct.) 1939.
5. Camp, J. D.: The Roentgenologic Diagnosis of Intraspinal Protrusion of Intervertebral Disks by Means of Radiopaque Oil, J. A. M. A. **113**: 2024 (Dec. 2) 1939.

ical diagnosis of the condition will result in further limiting its use. Thus Love [6] operated in ten cases and Craig in twenty-seven in which the clinical diagnosis was made without the use of the contrast medium. Dandy in 1918 suggested air as a contrast medium in myelography. Chamberlain and Young [7] employed air and oxygen in more than 300 spinograms and found the method accurate and reliable. Both air and oxygen are entirely harmless and are rapidly absorbed. Camp, however, states that its satisfactory use is restricted to the lumbar region and that the accuracy of the diagnosis is not equal to that attained with iodized oil. The ideal radiopaque agent has not thus far been found.

As was to be expected, most of the criticism has come from orthopedic surgeons, for they have seen innumerable painful backs and cases of sciatica improve with conservative treatment like warmth and rest, manipulation, traction, physical therapy, fasciotomy and what not. While others may not appreciate the intricacy of the functional mechanism of the lower part of the back and the variety of derangements arising from it as do the orthopedic surgeons, it is probably equally true that the structures enclosed within the bony framework of the spinal column are for them somewhat of an unexplored terrain. The most drastic criticism appeared in a recent issue of the *British Medical Journal* by Pappworth.[8] He indicates that he is not convinced that a protruded disk is not "merely an incidental finding and not the cause of the symptoms." He poses the following questions: "Can retropulsion of the nucleus pulposus cause symptoms? If it can, is a laminectomy the only treatment? Are the results of laminectomy such as to justify operation?" The criticism is based on seven articles written by the Boston and the Mayo Clinic contributors. Attention is called particularly to statistical discrepancies in a paper by Barr. In view of the fact that a new clinical concept is a matter of accumulating and varying experiences, it is not quite clear why Pappworth did not review the entire literature on the subject. Had he done so he would not have run into the error of stating that "Love and Camp do not believe trauma to be an important etiological factor." Actually Love states "From a study of our cases the important conclusion emerges that a history of trauma frequently precedes the onset of symptoms." [9] Pappworth points out that the most frequent age incidence was given as 40, "an age at which a normal disk is rare to find," and argues that such disk lesions as were found at operation could well be a coincidence rather than the cause of the symptoms. That, of course, is the opposite of the opinion entertained by the authors, namely that the frequency of the degenerative changes in the disk is what facilitates the rupture of the annulus fibrosus and the consequent escape of the pulpous mass. With regard to the intermittence of the symptoms, it is freely admitted by Love, Mixter and other workers that there is no satisfactory explanation for it. It may depend on the regression of the edema so frequently found in the protruded fragment, on its temporary diminution in size or on the degeneration of the nerve trunk from pressure by the mass. The fact that not every symptom in a complex can be explained does not negate the complex. Pappworth quotes Barr to the effect that fusion operations were done in from 40 to 50 per cent of his cases. This raises a doubt in his mind as to whether "the time in bed and the absence from work or the fusion itself are not responsible for the relief of symptoms." The neurosurgeons at the Mayo Clinic did not perform the fusion operation and have obtained gratifying results.

Without going into further detail, it may be said that the same charge of inaccuracy which Pappworth levels against Barr and Love is equally applicable to his own statement. A skeptical attitude based on insufficient and inaccurate data recalls the ruralite who, on first seeing a dromedary, exclaimed "I don't believe it; there ain't no such animal."

6. Love, J. G.: Protruded Intervertebral Disks with a Note Regarding Hypertrophy of Ligamenta Flava, J. A. M. A. **113**: 2029 (Dec. 2) 1939.

7. Chamberlain, W. E., and Young, B. R.: The Diagnosis of Intervertebral Disk Protrusion by Intraspinal Injection of Air: Air Myelography, J. A. M. A. **113**: 2022 (Dec. 2) 1939.

8. Pappworth, Sidney: Retropulsion of the Nucleus Pulposus, Brit. M. J. **2**: 1038 (Nov. 25) 1939.

9. Love, J. G.: Discussion on Prolapsed Intervertebral Disk, Proc. Roy. Soc. Med. **32**: 1699 (Oct.) 1939.

EFFECTIVE STERILIZATION OF EATING UTENSILS

The extent to which disease germs are disseminated in public eating and drinking places, such as restaurants, lunch rooms and beverage "parlors," is a matter of public concern. Numerous organisms, such as hemolytic streptococci, pneumococci and diphtheria bacilli, have been discovered on tableware and hand-washed dishes. A recent report [1] confirms the value of chlorine as a sterilizing agent.

A bacteriologic survey was made in the town of Peterboro, Ont., of eighteen, mostly small, public places in which food or beverages were dispensed. All but three had double metal sinks. All used towels for drying purposes. Bacteriologic specimens were obtained by rubbing sterile swabs at least three times over the entire area of spoons, forks and tumblers that would come in contact with the user's mouth. These specimens were taken after the noon or evening "rush" period after the utensils had been washed and made ready for use. Samples of wash and rinse water were taken by means of sterile pipets and placed in sterile vials. The temperature of the wash water varied from 95 to 140 F., that of the rinse water from 48 to 150 F. On the assumption that a plate count of 100 is a reasonable maximum to be set for eating utensils, laboratory examinations showed that more than half of the restaurants were not properly sterilizing the utensils or satisfactorily cleaning them before sterilization. They

1. MacPherson, R. M.: Sterilizing Eating Utensils by Chlorine, Canad. Pub. Health J. **31**: 79 (Feb.) 1940.

disclosed the presence of colon bacilli, diphtheroids and streptococci in 90 per cent of the specimens. The total number of organisms ranged from ten to 35,000. The total number of bacteria in wash water was between 100 and 400,000, while that of the rinse water was from two to 47,000.

A follow-up survey was made several months later after a chlorine concentration of 100 parts per million had been proposed, double sinks installed where previously lacking, proper instructions given and periodic checks made to determine whether the chlorine used in the rinse water was of sufficient strength. The results were highly gratifying. After sterilization with chlorine solution the bacterial count per utensil was found, in all but one case, to be below 100 and in many instances organisms, such as colon bacilli, were not detected either on utensils or in specimens of the rinsing water. Only four specimens of wash water and one of rinse water exceeded 1,000 bacilli. Since the temperature range of the wash water and the rinse water was the same as in the preliminary survey, the whole credit for sterilization is given to chlorine, a simple and inexpensive sterilizing agent. The report emphasizes that two sinks are essential for prophylaxis, that drying by hand towels has no place in any system of dishwashing in public places, and that the mere dipping of unwashed glasses in a chlorine solution without previous cleaning is insufficient, though frequently done in beverage rooms.

Current Comment

ARMY MEDICAL LIBRARY BUILDING DELAYED

More delay in providing adequate quarters for the Army Medical Library now results from the action of the House Committee on Appropriations on President Roosevelt's budget recommendation that $600,000 be made available for the purchase of a site and for the drafting of plans for the new building. The committee recommended that only $130,000 be now made available and earmarked this sum for use in the preparation of plans. This recommendation was predicated partly on the view that the act of the Seventy-Fifth Congress authorizing the construction of the new building contemplated the use of government owned property and hence did not authorize an appropriation for the acquisition of a site. The committee pointed to the fact too that the act authorized the Secretary of War to construct the building and not the Public Buildings Administration as proposed in the budget. The Military Establishment Appropriation Bill, H. R. 9209, embodying the recommendation of the committee, has passed the House of Representatives and is pending in the Senate Committee on Appropriations. The Congress can hardly be accused of precipitant action in this matter but the House committee did record itself as believing that "there is unquestioned need for the early provision of appropriate housing for the Army's medical library, which is generally recognized to be the most valuable collection of medical literature in the world." In view of this recognition of the urgency of the situation, the continued irresolution with respect to this project is difficult to understand. An invaluable, unique, irreplaceable collection of scientific material thus continues to be housed in a veritable fire trap, while immense funds are voted for purposes not nearly so pressing.

NEW HOSPITALS OR MORE SUPPORT FOR EXISTING HOSPITALS

At a recent hearing in Washington before a subcommittee of the Senate Committee on Education and Labor, Dr. Parran, Surgeon General of the United States Public Health Service, supporting the George-Wagner bill, introduced into the record the replies he had received in response to inquiries addressed to all state health officers asking what hospital facilities were needed in their respective states. From five states a reply was not received. From twenty states health officers answered that there was no need for additional general hospitals. Justifiable, therefore, is the conclusion that in more than half of the states, as far as general hospitals are concerned, there is no need for new construction. In the remaining states nine health officers indicated in a general way that more hospitals were needed, basing the statement in some cases on the fact that the ratio between hospital facilities and population fell short of some arbitrarily assumed standard or that a certain number of counties in the state were without a general hospital. In only fourteen of the forty-eight states did the health officers allege a specific and definitely localized need. These states were:

Rocky Mountain Region	Percentage Occupancy of General Hospital Beds	Elsewhere	Percentage Occupancy of General Hospital Beds
Colorado	63	Florida	59
Idaho	61	Kansas	63
Montana	62	Michigan	71
Nebraska	60	Mississippi	54
New Mexico	56	New York	79
Utah	61	West Virginia	58
Washington	68	Wisconsin	65
Average	62	Average	64

In a number of instances the statement of need was qualified by the comment that the community would be unable to support a hospital. In none of the states outside the Rocky Mountain region is there any appreciable area which does not already contain a general hospital. Probably, therefore, what the health officers of the other states desired to indicate was a lack of tax supported hospitals or of any provision by which public funds could be used to pay for the care of indigents in the private institutions now available. Altogether, the reports of these health officers seem to show that, apart from the sparsely settled desert or mountainous regions of the West, which, in any case, could not maintain satisfactory hospitals, and the lack in the South of adequate accommodations for Negroes, the really urgent need at the present time is not new hospital construction but more liberal provision of public funds to pay for hospitalization in existing institutions of those who are unable to provide for themselves.

ORGANIZATION SECTION

THE WAGNER-GEORGE-LEA BILL TO PROMOTE THE NATIONAL HEALTH AND WELFARE THROUGH APPROPRIATION OF FUNDS FOR THE CONSTRUCTION OF HOSPITALS

HEARINGS BEFORE THE SUBCOMMITTEE OF THE COMMITTEE ON EDUCATION AND LABOR, MARCH 18

PRESENT: SENATORS MURRAY, CHAIRMAN OF THE COMMITTEE; THOMAS OF UTAH, LAFOLLETTE OF WISCONSIN, ELLENDER OF LOUISIANA, TAFT OF OHIO, WAGNER OF NEW YORK AND GEORGE OF GEORGIA

(Concluded from page 1377)

Dr. John P. Peters, Secretary of the Committee of Physicians for the Improvement of Medical Care

DR. PETERS: These hospitals, we hope, will be regarded as initial experiments in community medical care which will aid in the discovery of formulas for the establishment on a wider scale of exemplary coordinated health services. Care should be taken that hospital plans be not accepted which will compromise the future development of a larger program. It is the earnest hope of our committee that this project shall not be undertaken as a substitute for a more comprehensive health program but as a step toward such a program. Desirable as it may be for communities to take the initiative in solving their own problems, the greatest need for community hospitals is likely to be found in localities that are too unorganized to take concerted action without some stimulus from above and too poor to assume the whole burden of support of even a modest hospital from their own resources.

Section 4, establishing a National Advisory Council of experts, is in our opinion of the utmost importance. In our statement it was suggested that this council be appointed by the President rather than by the Surgeon General, although authority should reside in the latter. The question may be raised whether the most valuable quality of an advisory council, its disinterested judicial attitude, may not at times be jeopardized if the appointment of the council is entrusted to the administrator whose actions are to be guided and sometimes subjected to criticism by this council.

It must be realized in advance that physicians of the quality desired for these hospitals cannot be attracted to the neediest communities by the mere presence of a hospital; they must have the assurance of at least a decent living. It must be certain that the bill is so drafted that support of these hospitals may include—I should prefer must include—assurance of payment for professional services. We are also of the opinion that payment by salary for the time devoted to hospital work is preferable to payment of fees for individual acts because it favors the coordination of services for the best interests of the organization as a whole.

William F. Montavon, Director, National Catholic Welfare Conference

MGR. MONTAVON: The Catholic Hospital Association, the National Conference of Catholic Charities and the National Catholic Welfare Conference, for whom I speak, welcome any sound practical method for making hospital care and health services available to those needy localities to which the President refers in his message of January 30. We agree with the President and this committee that any adequate solution of this problem calls for financial cooperation between national and local governments and requires the full, wholehearted and free cooperation of the local community as well. The purpose stated in the title of this bill fails to take into account the clear distinction between the problem we now face and the more complex problem of national health security. But to link these local situations up with a national health security program, with the standardization that a national program demands, we believe would complicate and tend to defeat the purpose of this bill. I suggest that in this bill we omit all reference to national health and state the true purpose of the bill in simple language, as "A bill to provide for the general welfare by an appropriation of federal funds for the construction of needed hospitals" and that we change the provision in section 1 of the act to read "This act may be cited as the Hospital Construction Act of 1940."

We believe that in the maintenance and operation of these hospitals the service to the community served by the hospital will be greatest if the bill is amended to provide a higher degree of autonomy to the community in the administration of the hospital than seems to be contemplated in the bill now before you. The President contemplates not a hospital operated directly by a local government. He does recommend that projects be submitted by responsible public authorities, but he also relies on public spirited citizens with means and on pay patients to supply income required for guaranteeing adequate satisfactory hospital services to the whole community, including all who "literally can afford to contribute little or nothing toward their treatment." A hospital looking to such sources for its income should be governed by a board of citizens and not by the government.

We submit the following amendments: [Copy was submitted.]

The amendments recommended a Federal Advisory Hospital Council (hereinafter referred to as the "council") to consist of seven members to be appointed by the President of the United States with power to select their own chairman. Each member of the council shall be a competent authority outstanding in matters pertaining to medical care, hospitals and other health and welfare services. The statement also proposed: "No new hospital facility shall be approved under this section of this act to be erected in any community which at present has a hospital facility owned and operated by government or by a nongovernmental association or voluntary corporation of private citizens organized and operated not for profit, or where adequate hospital service can practically be made available by providing free ambulance service to such a hospital in a neighboring community."

It was suggested that training of personnel be omitted, as this was a hospital construction program and not a hospital administration program and we believe that the problems of personnel are problems of hospital administration and should not be controlled federally.

The statement pointed out that in the bill the lease is terminated and no provision is made whatever for what shall happen to that hospital after that. Who is going to operate it, if at all? Is it going to remain there an empty building or for sale or what not? We suggest that we add ". . . and the Surgeon General on recommendation of the council and in cooperation with local agencies shall take such steps as will permit the temporary continuance of the services of the hospital needed by the community pending fulfilment by the lessee of the requirements of this act."

The speaker also presented a letter written by Alphonse M. Schwitalla, S.J., who is the president of the Catholic Hospital Association. He stated that "the Catholic Hospital Association is in agreement with the purposes of this bill, recognizing that there are some areas in which a hospital is needed. In view of the representations made to the hospital and the medical associations at the conference with the President, it seems somewhat

disquieting that an appropriation is contemplated in S. 3230 not only for the year ending June 30, 1941, but for each fiscal year thereafter" as in section 2 "and 'The President is authorized to allocate from funds appropriated pursuant to this act' sums not only for the fiscal year ending June 30, 1941, but also for each succeeding fiscal year," as authorized in section 9. He thought that the Advisory Hospital Council might be appointed by the President himself; that it would enjoy a measure of autonomy, at least in the selection of its own chairman and secretary; that it would meet with the Surgeon General, the latter, however, not being a member of the council itself; and, finally, that the council would be free to conduct its own investigations when it desired to do so, so that the experimental character of the project might be completely and fully safeguarded.

He wished to see some restriction on studies to be made by the Surgeon General and on training of personnel. Also the officers of the Catholic Hospital Association would prefer to see a clarification of the functions of the Surgeon General and of the advisory council with reference to the various local groups who are interested in a hospital project.

Dr. Fred G. Carter, President of the American Hospital Association

DR. CARTER: We agree in principle with the purposes of the program outlined in the National Hospital Act of 1940, which have to do with the provision of needed hospital facilities to serve rural communities and economically depressed areas. We know that there are certain sections of the country which are not now adequately served by hospitals and we are glad to support legislation looking toward the alleviation of this condition.

We come to this hearing mindful of the fact that we have had definite assurances that the program was to be an experiment covering a period of one year, or at most financed by a single appropriation, and we are disturbed by finding that the bill provides for its indefinite continuation. We firmly believe that before permanent legislation is enacted the results of the experiment should be carefully evaluated. Many conditions not now apparent will be encountered in the trial period. It will be found, for instance, that the mere building of a hospital is a relatively simple problem when compared with the task of integrating that hospital into its community. If the experiment proves the need for, and wisdom of, further effort, thought may then be given to ways and means of carrying on.

It can be taken as a major premise that a community which has the financial resources to support a hospital will be resourceful enough to secure one under present conditions. Support of the hospital after it is constructed is even more important than the construction. This bill asks for assurances of support from all communities requesting hospitals. Those most in need will be unable to give such assurances. Surely some provision should be made for partial subsidy during the period in which communities are adjusting themselves to their new responsibilities. Philanthropic foundations have found that their work of hospital construction in rural areas had to be followed up by partial operating subsidies for periods of three years or more.

We note with satisfaction that the act contemplates hospital construction only in such communities as can demonstrate the need for such facilities. We sincerely hope that there will be no duplication of reasonably adequate existing facilities, private or public, in any community.

Among hospital people the utmost respect exists for the Public Health Service but under the provisions of this act it is embarking on a venture which is somewhat strange to its field of activity. The National Advisory Hospital Council therefore should be the strongest obtainable if grave errors are to be avoided. Men who have had actual hospital administrative experience certainly should constitute a part of this council. It is fair to say that the success or failure of the experiment will depend to a great extent on the personnel of the council and the responsibilities delegated to its members.

Dr. Kendall Emerson, Managing Director, National Tuberculosis Association

DR. EMERSON: The National Tuberculosis Association appreciates this opportunity to record its approval of the National Hospital Act of 1940 (S. 3230, H. R. 8240). The act falls far short of making adequate provisions for all the needs of the country. The principles on which its provisions are based, however, are sound and susceptible of extension ultimately to fill these needs. It is to be noted with special approval that the act does not limit the services of the general hospitals for which it provides to any single type of illness or disease.

Recently an official inquiry was made among health commissioners of the several states to determine for what particular disease beds were most needed in their jurisdictions. More than half the replies indicated an outstanding lack of beds for the hospitalization of tuberculous cases. In 1900 the number of beds for the tuberculous in this country approximated 6,000. In 1939 this number had grown to 90,000 beds. During the same period the death rate from tuberculosis in the United States dropped from 200 per hundred thousand of the population to less than 50. Isolation of the patients is our main reliance in the control of tuberculosis, since we have no specific preventive or curative measure for the disease. The National Tuberculosis Association suggests the desirability of allocating a definite proportion of the funds authorized under the National Hospital Act of 1940 specifically for the provision of beds for the tuberculous. The association desires to express its endorsement of the act. However, it recognizes the act as only one step toward the provision of adequate general hospitalization which the needs of the country demand.

SENATOR TAFT: Do I understand that the American Hospital Association would be in favor of a complete federal system of hospitals?

DR. EMERSON: This is the National Tuberculosis Association.

SENATOR TAFT: That the National Tuberculosis Association would be in favor of a complete federal system of hospitals? Are you now expressing approval of the federal government building hospitals throughout the United States?

DR. EMERSON: I am now commenting solely on the bill as presented.

SENATOR TAFT: The principle of the bill is construction of hospitals by the federal government owned by the federal government—owned by the federal system.

DR. EMERSON: In areas where such hospitals are needed.

SENATOR TAFT: A federal system of hospitals your association approves then?

DR. EMERSON: In areas not otherwise provided for as the bills provide.

SENATOR WAGNER: I think that is an important limitation.

DR. EMERSON: It is, sir. That is as far as we have gone in approval, but that is the way we interpret the bill.

SENATOR TAFT: The principle of the bill is the establishment of a federal hospital system in areas where there is need but where states are perfectly able to provide it if they wish to do so.

DR. EMERSON: The bill states that areas where they are needed and the hospitalization does not already exist or is not comparable.

SENATOR TAFT: Why shouldn't the states do it under the constitution? This is a function of the states, not the federal government.

DR. EMERSON: Well, I should say that that would have to be answered by the presentation of another bill to compete with the present bill. We have the feeling that the federal assistance in such matters is, at the present time, desirable.

SENATOR TAFT: Federal assistance, yes. That is not my question. The principle of this bill is federal construction and federal hospital system and that is what I understand your association fully approves.

DR. EMERSON: We would also put in the reservation decidedly that Mr. Montavon brought up: that it is clearly understood by us that the appropriation of a limited amount for a limited number of hospitals is proposed by the President on an experimental basis. We would certainly put that in as a proviso in our endorsement of the bill, so I think in answering your question I could say "no." We did not approve it *carte blanche* for a general federal hospital program. We heartily approve the experimental factors as stated.

SENATOR MURRAY: Are not tuberculosis hospitals on a somewhat different basis from general hospitals, these tuberculosis hospitals for the control of a disease that is nationwide and is not confined to state boundaries? Isn't it a program that the federal government would naturally be interested in?

DR. EMERSON: I should heartily agree with you in that statement.

SENATOR TAFT: Do you know in what states the state has the responsibility for tuberculosis hospitals and in which it is handled by local governments?

DR. EMERSON: I am afraid I can't answer that statistically. There are a good many states that have their own state hospitals and there are a good many that have county hospitals. They are still governmental but not always state institutions. Many states have the dual system.

SENATOR TAFT: Are there many private, not for profit, tuberculosis hospitals? Or are they usually governmental?

DR. EMERSON: There are approximately 7,000 beds for the tuberculous owned by private hospitals which would be in the profit-making group. That is, they are privately owned institutions and supposed to be self supporting. Approximately 7,000 beds, and nearly 90,000 are publicly owned.

SENATOR TAFT: It has been a governmental function much more than general hospitals, hasn't it? In proportion, I mean.

DR. EMERSON: In the past forty years the ratio has changed completely from a large number of privately owned beds to an overwhelming number of publicly owned beds; somewhere in the neighborhood of very nearly 90,000 publicly owned. In the documents accompanying this report, these needs are specifically recorded. The association has already given its endorsement to Senate Bill 2547, a bill "to impose additional duties upon the United States Public Health Service in connection with the investigation, treatment and control of tuberculosis." This bill recognizes the full gravity of tuberculosis as a preventable, epidemic disease and provides federal aid on an adequate scale to enable an aggressive program for the rapid and complete eradication of the disease.

Arthur M. Calvin, Chairman Legislative Committee of the American Protestant Hospital Association

MR. CALVIN: The American Protestant Hospital Association represents the major portion of the protestant church hospitals of America. It has been their desire at all times to cooperate with all health organizations and government bodies in promoting better health to the people of our country. If there is a need for the construction of small hospitals, as proposed in the bill, you should not overlook the fact that all who champion the cause of church hospitals must continue to insist that these voluntary institutions and agencies which have been set up, and whose functions have been carried on for many decades by heroic efforts of self-sacrificing individuals and organizations, must not be interfered with. Their further expansion and future development must not be impeded and the American people must not be deprived of the ultimate benefits that flow from them.

SENATOR TAFT: Do you see any reason why the bill shouldn't provide for a joint association with a private group like a church group—

MR. CALVIN (interposing): Not at all, sir.

SENATOR TAFT (continuing)—for the construction of a hospital? I mean supposing a church group came in to the Surgeon General and said that they had a certain endowment fund and they had a certain amount of money that could be devoted to the maintenance of a hospital if the federal government would build a hospital for them, or they might even be able to contribute 10 or 20 per cent of the cost—

MR. CALVIN (interposing): No objection whatever.

SENATOR TAFT (continuing) —do you see any reason why the federal government shouldn't extend federal aid to that kind of institution?

MR. CALVIN: No, sir.

SENATOR TAFT: As well as to build a general hospital?

MR. CALVIN: Yes, sir. We are in accord that in some areas and groups they are best served by governmental agencies. However, it is apparent from all indications that the uncertainties of the untried field of general governmental hospitalization are not an adequate substitute for the splendid present and past contributions of the volunteer church hospitals and their activities. The intention of this act, as is our general understanding, is not to destroy the voluntary initiative of church organizations or individuals and establish a vast system of governmentally controlled and operated general hospitals but to enter the field of hospitalization in poor rural areas and for the permanently unemployable where hospitals are to be supplemented, not superseded. Therefore it appears that this program should not be extended for more than one year, at which time the experience of such may be reviewed. As in education, so in health, private initiative should be encouraged where citizens are able to provide for their own health and well-being. And in our democracy we concur with this committee that government action should only be a last resort. We further submit the following recommendations which we desire written into the bill:

1. That the National Advisory Hospital Council should be composed of a fair proportion of hospital administrators.

2. That the National Advisory Hospital Council should take under consideration for approval of application for hospitals that such institutions shall maintain the standards which the American College of Surgeons, the American Medical Association and the hospital associations regard as minimal for rendering such service.

Agreeing as we do to the purpose of the bill, we are mindful of the importance of the selection of the members of the advisory council who will be given the responsibility of carrying out the intent of the bill. We desire that such advisory council be as receptive in accepting counsel from this association from time to time as has been the consideration shown us by the committee and other government officials.

SENATOR WAGNER: Are you a doctor?

MR. CALVIN: No, I am a layman.

SENATOR WAGNER: The bill provides, as we discussed a moment ago, the National Hospital Council, that six appointed members should be selected from leading medical or scientific authorities who are outstanding in matters pertaining to hospitals and other public services. Do you recommend that there be additional safeguard or don't you think this does—

MR. CALVIN (interposing): It doesn't specifically—

SENATOR WAGNER (continuing) —carry out the thoughts that you expressed?

MR. CALVIN: Senator, I don't think it specifically states that at least a portion of them should be hospital administrators, which we think would be most advisable.

SENATOR WAGNER: Oh, I see.

MR. CALVIN: Yes, sir.

SENATOR WAGNER: You think that ought to be a provision right in the act?

MR. CALVIN: Yes, I do, Senator.

SENATOR WAGNER: At least how many?

MR. CALVIN: Two at least.

SENATOR WAGNER: Thank you.

TUESDAY, MARCH 19

Dr. Reginald M. Atwater, Representing the American Public Health Association of New York

DR. ATWATER: We appear in support of this bill, S. 3230, because we believe it to represent a sound and a desirable next step toward the achievement of better health for all people. A concept of the close interrelationship between preventive and curative medicine we believe is basic to the public health program. We wish to be recorded as opposed to any plan which regards treatment and cure as belonging in water-tight compartments. The American Public Health Association has endorsed in general the plans for federal aid to the states for the construction of additional hospital facilities and hospital care as needed. We believe that it is essential that any program, to be worthy of federal aid, should include adequate provisions for the maintenance of high personnel standards, and we believe that the benefit from federal aid to such local agencies should be withheld when it is found that substandard services are being furnished. We regard as especially important the provision for the training and instruction of personnel and the emphasis which is laid in the act on provisions for the most disadvantaged areas.

We believe it, Mr. Chairman, unnecessary and indeed unwise to provide in this bill for what particular use shall be made of these hospitals, because it is not possible to formulate such a statement which will apply equally well in all parts of the country, or to anticipate fully all the possible contingencies.

The association approves a liberal definition of the term "hospital" as contained in the act because there is a variety of structures, like dispensaries or health centers, laboratories and x-ray units which will best serve some of the rural communities and the economically depressed areas.

Beyond the reasons for supporting the bill which seem to us logical and important we believe that the provisions for hospitals should not depend merely on cold statistical factors, about which so much of this testimony has revolved. There are other and important reasons why good hospital care is not a luxury but a necessity. We maintain that the count of hospital beds represents only a part of the value of such an institution in the community. A good hospital, even though built and maintained on simple lines, means better medical care. The adequate housing for a local health department, which this bill can provide, may mean as much to a locality through laboratory, x-ray and health clinic services as the beds themselves may mean. Let's take the health department out of the basement of the county courthouse, where it usually is, and relate it to the other medical and sanitary services where it belongs, and let us show the world that we know how to build for health security as intelligently as any nation on earth.

Dr. C. D. Bowdoin Representing the Georgia Department of Public Health

DR. BOWDOIN: The first exhibit is two charts which show a comparison of the 1938 death rates per hundred thousand of population in Georgia and the United States for typhoid, diphtheria, dysentary, malaria, pellagra, syphilis, puerperal or maternal, diarrhea and enteritis under 2 years of age, tuberculosis, cancer, pneumonia, infant mortality, cerebral hemorrhage and nephritis. The death rate from all of these diseases is higher than that prevailing in the United States except cancer. I might add that the death rate from heart disease is also slightly higher than that prevailing in the United States at large. Our interpretation of the low cancer death rate is that a sufficient number of our people do not live to the age when cancer is most common.

The second exhibit is a map reproduced from THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, March 11, 1939, showing available general hospital beds per thousand of population by states in the United States. Georgia is in the lowest group and is classed with Mississippi, Kentucky and Arkansas as having less than two beds for 1,000 population.

The third exhibit is a map of Georgia which classifies the counties into population groups of less than 5,000, from 5,000 to 10,000, from 10,000 to 20,000, from 20,000 to 50,000 and 50,000 and above. There are no general hospitals in the seven counties having a population less than 5,000, only three general hospitals in the forty-one counties having a population of from 5,000 to 10,000, only thirteen general hospitals in the sixty-five counties having a population of from 10,000 to 20,000, and twenty-eight general hospitals in the thirty-nine counties having a population of from 20,000 to 50,000. All seven counties above 50,000 population have general hospital beds. There are eighty-four registered general hospitals located in fifty-one of the 159 counties in Georgia.

The fourth exhibit classifies the counties of Georgia according to bed population ratios into five groups: Twenty-three counties have a per bed population ratio of 1 to 500 or less, twenty counties have a per bed population ratio of 1 to 500-1,000, seven counties have a per bed population of 1 to 1,000-3,000, one county a per bed population ratio of 1 to 3,000-4,000, 108 counties in Georgia have no general beds in registered hospitals, and the fifth and final exhibit is a population density map by militia districts.

Each tiny black dot represents twenty-five rural inhabitants; the large black dots represent towns and cities in proportion to their relative size; the red circle represents an estimated need of seven beds per thousand of population. The clear portion of the circle represents that percentage of seven beds per thousand of population now available. The red portion of the circle represents the percentage of beds needed to bring the number to seven beds per thousand in those counties having registered hospitals. The remaining counties have no general beds in registered hospitals. On the basis of seven beds per thousand of population Georgia now needs 17,159 additional beds. If we use the accepted 4.5 beds per thousand of population, which in my opinion is low, Georgia now needs 9,351 general beds in addition to the existing 4,702 beds now available.

The 1939 general assembly of Georgia amended section 92-3701 of the code of Georgia of 1933 by adding an additional purpose for which county taxes may be levied and providing authority to the counties to levy a tax to provide medical or other care and hospitalization for the indigent sick people of the respective counties. This tax is not to exceed 1 mill.

To my mind this plan has more advantages than any other so far developed. In keeping with the trend of the times it would offer Georgia experimental opportunities of value not only to the state but to the nation, to develop a sane plan for the medical care of the underprivileged. Under this plan medical centers could be developed, providing not only hospital care but diagnostic services, outpatient clinics, laboratory and x-ray services, tuberculosis, venereal disease, immunization, mental hygiene, orthopedic, well baby and maternal clinics. The medical center should establish a sound working relationship between the public health worker, the welfare worker, the private physician and the public at large. The multiplicity of benefits, soon so apparent to all, should soften such opposition as may develop to the cost of the service, which would be relatively small in comparison to the value received in the removal from exposure of well persons to illness, the prevention of incapacitation or prolonged sickness, and in lives directly saved.

SENATOR MURRAY: How many counties do you say there are that have no hospitals at all?

DR. BOWDOIN: One hundred and eight counties with no hospitals.

SENATOR MURRAY: How many counties do you have in Georgia?

DR. BOWDOIN: One hundred and fifty-nine. Georgia is the largest state east of the Mississippi River.

SENATOR MURRAY: Montana is a very large state and we have only fifty-six counties. Don't you think you have too many counties in Georgia?

DR. BOWDOIN: You are exactly right, Mr. Chairman, and I think maybe this plan will help us to consolidate some of them.

Dr. W. S. Rankin, Director the Duke Endowment, Charlotte, N. C.

DR. RANKIN: I am not appearing either as an opponent or as an advocate of the bill. We have had about fifteen years' experience in dealing with small hospitals or with all the general hospitals, I might say, of North and South Carolina: If there is any information that we have accumulated that might be helpful to the committee, I would be glad to give it to you.

SENATOR MURRAY: Have you any statistics already prepared that you could leave with us?

DR. RANKIN: The best thing I could leave with you, Mr. Chairman, I presume would be our annual report. It is very brief and boiled down. It might be helpful. It gives you costs of construction, costs of operation, and so forth.

SENATOR MURRAY: We will be very glad to have it.

Dr. Carl G. Roberts, Representing the National Medical Association

[Dr. Roberts described the National Medical Association and the American Medical Association, pointing out that today they are cooperating amicably on a common basis of understanding as to the manner in which the national health problems should be met.]

The life expectancy of the Negro is anywhere from eight to ten years shorter, his death rate in some instances from 50 to 100 per cent higher. There is an inexcusable high incidence of disease among Negroes. Some of the reasons for these conditions are inequity, inadequacy and low economic status, inequity of distribution of medical care and hospitals, inadequacy of those facilities in those areas in which they are distributed.

[He pointed out the shortage of hospital beds and of facilities for medical training for Negroes.]

For a Negro population of approximately 230,000 in Chicago, one twelfth of the population has access to only one fortieth of the beds, and that includes the large charity institutions. Less than 3 per cent of the hospitals in Chicago, including the one colored hospital, and all the charity institutions, accepted Negro patients. Of that 3 per cent, 2.5 per cent were either charity beds or the Negro was used for teaching purposes. As this is illustrative of the problem as it exists in several of the Northern centers, and the need in these urban centers is just as great as it is in some of the rural ones, because out in the rural districts they at least have access to light and air, which is not true to such a great extent in the cities, we would recommend that the purposes of this bill be broadened to include aid to existing facilities in the large urban centers in instances in which great urgency of need is shown. The plight of the Negro doctor is even more difficult than that of the Negro patient. There are some facilities in some sections of the country, aside from his own hospitals, into which the Negro patient is admitted, but ofttimes the Negro doctor who is treating that patient, figuratively must stop at the door because his privileges stop there and he is not admitted.

Again referring to the fact that these problems are not sectional; for instance, in Boston there is practically no opportunity for a Negro surgeon to operate on his own patients. The same thing is now true in Los Angeles, true to a larger extent than it is in many of the larger Southern cities. As the future and welfare of the Negro health problem is, in the last analysis, bound up with the opportunity that is afforded to his own physicians to care for his health, we feel that no great success can be attained until these opportunities are expanded and enlarged.

The National Medical Association respectfully recommends the following amendments to the Bill S. 3230 (H. R. 8240):

1. Page 2, line 14: Insert after the word "population" "without discrimination on account of sex, race, color or religion."

2. Page 2, line 14: The term "all groups of the population" as used in this act shall include professional as well as lay people provided that they shall qualify under the required standards of competence.

3. Page 4, line 23 (C). Following the word "hospital" add "without discrimination on account of sex, race, creed, color or religion."

The National Medical Association recommends further:

That the act should be broadened in such manner as the committee may deem fitting and proper to include subsidies or aids to existing hospital facilities where urgent needs are shown and satisfactory prospects exist for rendering unusual service in control of disease.

With incorporation and adoption of the foregoing recommendations, the National Medical Association approves Bill S. 3230 (H. R. 8240).

Ernest R. Carney, President National Hospital Association

[Mr. Carney, who is administrator of the Parkside Hospital (for Negroes) in Detroit and president of the National Hospital Association of the United States, an association of Negro hospitals, described the organization.]

There are approximately 110 Negro hospitals located in various parts of the United States. During the past two years I have visited ninety-seven of these institutions. They extend from Detroit on the North to New Orleans on the South, and from Newark, N. J., on the East and as far as Phoenix, Ariz., on the West. A large proportion of these hospitals are owned or under the supervision of Negroes. More than 50 per cent are privately owned by doctors because they are denied the privilege of treating their patients in white hospitals. These hospitals have a bed capacity varying from seven beds in a rural community to 685 beds in one metropolitan city in the Midwest. They give employment to more than 2,000 Negro nurses and other personnel. Approximately half the Negro doctors use their facilities for diagnostic and therapeutic purposes. Twenty per cent of these institutions have met the minimum requirements for approval by the American College of Surgeons and are approved by the American Medical Association for intern training.

During the past five years about 6,000 beds have been made available for Negro patients in various parts of our country through grants and loans by the Public Works Administration. Sixty per cent of these beds are used for the insane, 25 per cent in general hospitals and 15 per cent for tuberculosis.

As has been pointed out by previous witnesses, an analysis of beds by location in general hospitals shows that there is a great need and a marked tendency for more and more beds that must be made available for Negro patients in smaller towns and rural sections, especially in the South. If more beds are added by building new hospitals with wings and separate quarters for Negroes the patient will be benefited, but the Negro doctors, nurses and other personnel will not be benefited. We suggest, however, that representatives in Congress amend the bill, page 2, section 3, line 12, to read as follows: "Such hospitals will be made available under appropriate conditions to all persons without discrimination on account of sex, race, creed, color or religion," and page 4, section 6, line 22, and following to read "to provide training and instruction of personnel who will be required in connection with the hospital without discrimination among such personnel on account of sex, race, creed, color or religion."

The bill calls for assurances of support from the communities requesting the hospitals. Negro communities most in need of hospitals cannot give definite assurances. Obviously some provision must be made for whole or partial subsidy for their maintenance. Before final legislation is enacted we hope that there will be no duplication or elimination of any reasonably adequate private hospitals now in existence.

Charles H. Houston, Representing the National Association for the Advancement of Colored People

MR. HOUSTON: I will say nothing about need except to point out the fact that in a recent message the President himself made special reference to the need of Negro patients in the Southern states and your own committee, in making its preliminary report on Senate Bill 1620, page 34, section 4, part 7, on the question of protection of minority population groups, said "The committee believes that there should be just and equitable allocation of funds according to the need for services (referring to minority groups) and will study carefully the amendments suggested to carry out such purposes." We support the bill with the amendments which I shall suggest.

The question has been raised about the ability of the economically depressed areas to sustain and maintain the hospitals after they are once furnished by the federal government. The mere fact that you cannot cover all of the localities which need this particular service is no reason that the federal government should not take this initiatory step of covering those which can be reached within the terms of the limitations of the bill. We regard the bill itself as a sort of a demonstration to the nation of what adequate public health service can be through the cooperation of the federal government and the local authorities, the federal government furnishing the facilities and the local authorities furnishing the administration and the cost of upkeep and maintenance. Although the $10,000,000 perhaps would not even cover the entire needs of hospitals, perhaps say in the state of Georgia, according to the testimony which has just been given, and certainly not in Georgia and the other areas of the South, to say nothing of the other sections of the country, there is no reason why this beginning should not be made. As between the proposition of maintaining the abstraction of states' rights and letting people suffer from inadequate health coverage and service, it seems to us that on the application of the local authorities themselves to the federal government you have all the protection which any person interested in maintenance of direct local control over public health could ask for.

[Mr. Houston followed the same general lines as the two preceding speakers but asked that a Negro be included on the council.]

On the question of training of personnel, we should ask that there be an amendment by way of addition to provide that

training and instruction of personnel will be required in connection with the hospital without discrimination among such personnel on account of sex, race, creed, color or religion.

Paul B. Cornely, Associate Professor of Public Health, Howard University, Washington, D. C.

[Dr. Cornely spoke for a joint committee of several organizations.]

The general death rate of the Negro is from one and one half to two times that of the white population. The average expectation of life of a Negro baby born today is from ten to twelve years shorter than that of a white infant. The death rate from tuberculosis among Negroes is from two to three times that of white persons. In the District of Columbia, for instance, the disparity is five to one, while in Baltimore and Detroit the same condition holds true. Dr. Parran has consistently stated that approximately six times as many Negroes suffer from syphilis as do white persons. The death rate from pneumonia, heart disease, childbirth and diseases of infancy show these same inequalities. There is no doubt that these proportions are due to a large extent to the lack of adequate and sufficient amounts of medical and hospital facilities. In the state of Texas there are approximately 28,000 beds for 4,000,000 white persons as compared to less than 200 for approximately 900,000 Negroes. In the Southern rural area approximately 80 per cent of the births are taken care of by midwives and only 0.6 per cent of the babies born in the rural areas to Negroes are born in hospitals. In a city which I visited in the South, in the Negro ward two and three Negro patients were sleeping in the same bed in this hospital, and that was in 1935.

Dr. Dorothy Boulding Ferebee, Washington, D. C.

[Dorothy Boulding Ferebee, a Negro woman physician, a graduate of Tufts Medical School, stated that her national sorority approves the principles of this bill, subject to the amendments.]

On the basis of the experience of a national organization which has conducted a rural health project in Bolivar County, Miss., for the past five years during the summer months, and where we invested approximately $13,000 in an effort to alleviate some of the health conditions among the Negro share cropper families of the district, we have been able to see, on the basis of this experiment, a general improvement in the health of these people. Generally speaking, the Negro physician is not permitted in the public hospitals in the South. No physician can grow to his best competence without the opportunity to improve his skill and technic through the facilities of the scientific equipment of a hospital.

AFTERNOON SESSION

Charles Butler, Chairman Committee on Federal Public Works of the American Institute of Architects

MR. BUTLER: The American Institute of Architects commends the President for recommending the establishment of such hospital facilities, and the Congress for its intention to provide them, and offers all the aid it can give to bring about the desirable objective. We have two suggestions to make for possible amendments to the bill. The planning of hospitals is something which requires expert knowledge, men who have been trained in the field of hospital planning. The average architect doesn't know that. The medical profession knows pretty well what it wants but doesn't always know how to get it. We find that the medical men are apt to concentrate on their own particular specialties and not see the problem as a whole. The problem is particularly difficult in connection with these low cost hospitals which it is proposed to build. The hospital expert has got to know when to compromise, when to cut out certain things which can be cut out without harm to the patient, things that we should all like to have. Other things, of course, must be of the very best. That is what the hospital architect has been trained to do. He has to coordinate the requirements for efficient care of the patient with other factors such as inexpensive materials in many parts of the building and the need of forced ventilation in some rooms and not in others; he must simplify in every manner possible to permit ease and direct transportation of patients, distribution of food and supplies, and the reduction to the minimum of the work of the necessarily very limited staff, both nursing staff, orderlies and so on. A hospital architect also is trained in selection of sites for a hospital, that part of the work, and the choice of locations where the wind is favorable, where the sunlight and air are favorable, and one of his jobs is to get the orientation for the wards of the hospital and at the same time get the north light for his operating room. We therefore urge that the bill be amended to provide that there be appointed by the Surgeon General a committee of architects qualified by experience in hospital planning, similar to the National Advisory Medical Council already provided for in the bill. The second suggestion that we have to offer is that the bill be further amended to provide for the employment of local architects and engineers to prepare plans and specifications, and supervise construction of these hospitals.

SENATOR MURRAY: You mean to suggest that such a provision should be inserted in the bill?

MR. BUTLER: Yes.

SENATOR MURRAY: Couldn't that be done by the Advisory Committee, consulting with them?

MR. BUTLER: At present the bill reads that it practically automatically would go to the Federal Works Agency, that work would be concentrated in Washington, and that is what we think might, with economy, be changed.

We have been making a study of costs in New York State which is not yet complete, but throughout the state we get the general impression that it costs from 6 to 25 per cent more to have the work carried out by the state, as it is in New York State entirely, rather than by private architects and engineers. The work would, of course, be under the general control of the Federal Works Agency, which is exactly in the position of the client. The government, of course, not being a person, cannot be a client. It is officially the client, but its representative on earth is the Federal Works Agency, and it would be exactly in the position or role of the intelligent, informed client who knows what he wants and directs those men who are trying to get it for him. We believe that the saving in building costs would well exceed any extra expense there might be in the employment of local architects. We believe further that the giving out of this work to local architects and engineers in the smaller communities would be a tremendous help to the members of two sorely tried professions. The engineers and the architects have had just about the hardest sledding in the last ten years of any profession in the country. I think that is generally admitted. And these jobs, which may not look like enormous jobs in the large cities, 100 bed hospitals, costing $200,000 apiece, are a great big job to men in the smaller cities. There are men perfectly competent to do them, both architects and engineers. They may not get the mechanical engineers there, but the architects and the engineers are competent. It might also tend to dispel the idea that the government is trying to centralize the work in the Washington bureaus. After all, we have to admit that the progress of the architects of the United States in the last fifty years, which has put us just about ahead of the profession, has been done by engineers and architects in private practice.

John M. Carmody, Administrator of the Federal Works Agency

MR. CARMODY: I have discussed the plans with Mr. Reynolds of the Public Buildings Administration, and with Colonel Harrington. Mr. Reynolds, unfortunately, is out of the city but Mr. Louis Simon, who is the supervising architect and acting commissioner while Mr. Reynolds is away, is here. He has figures on costs, and Colonel Harrington also has figures on costs. They worked with Dr. Parran on the simple design of hospitals that I take it are to be built in areas where people are poor and where resources are not very great. In discussing it we have had in mind simplicity, we have had in mind the utility rather than expensive and expansive building.

SENATOR MURRAY: You have heard the testimony of the witness who just preceded you?

MR. CARMODY: I heard just part of what Mr. Butler has said. Mr. Butler and I have discussed that, not in connection with this particular program but in connection with the program in general. I think we are all aware of the fact that many architects in many parts of the country haven't had as much work as they would like to have. Similarly, engineers

haven't had as much work as they would liked to have had. As a matter of fact, a very considerable part of the work they have gotten in the past seven or eight years has come, either directly or indirectly, out of the public works program financed by the federal government. They have shared, I think, quite well in the work that has been built in the past seven years.

SENATOR MURRAY: It is my understanding that in all of the public works program local architects have been utilized in preparing the plans?

MR. CARMODY: Yes.

SENATOR MURRAY: But it has been suggested by the witness just leaving the stand that we should have an advisory board of architects, a provision for an advisory board of architects here in this bill, because, as he expressed it, they are more familiar with the scientific construction of hospitals and are more in touch with what should be the needs of the community and the location of the site and all that. What have you to say with reference to that?

MR. CARMODY: Well, I think that all of the intelligence that can be massed ought to be applied to the development of a program or to the construction of buildings erected for special purposes. I have a feeling that the more people you get into the program, the less progress you will make and the more expensive the buildings will be, and the more likely they will be to represent the ideas of a great number of people. For instance, I am not prepared to say specifically how much skill there is in the Public Health Service with respect to the design of a hospital. I dare say that if they haven't learned how to build a hospital by this time they ought to get some advice.

SENATOR MURRAY: I have a letter here from Mr. William Green, president of the American Federation of Labor, and I will have it inserted in the record at this point, because I think it raises some question with reference to the construction of these hospitals:

AMERICAN FEDERATION OF LABOR
Washington, D. C.

March 18, 1940.

The Honorable James E. Murray
Chairman, Committee on Education and Labor
The United States Senate,
Washington, D. C.

Dear Sir:

For the purpose of increasing available hospital facilities and creating new employment at present, the American Federation of Labor endorses the bill (S. 3230) to provide for the appropriation of $10,000,000 for the provision of needed hospital facilities for rural communities and economically distressed areas. We believe that the adoption of this bill would be a step in the direction of providing more adequately for the health needs of low income families. It would create some of the facilities needed for carrying out the broader program which we believe essential to a well rounded program of social insurance.

We do not regard this bill as a proper substitute for a more adequate program, but we favor it as an initial step. We urge, however, that the bill be amended to include a provision that all workmen, laborers and mechanics employed in the construction of any hospital financed under it shall be paid not less than the wages prevailing for the corresponding classes of workmen, laborers and mechanics employed on similar work in that locality. This provision is needed to safeguard the interest of workingmen by preventing the use of federal funds to depress prevailing wage scales.

Very truly yours,

WILLIAM GREEN.
President, American Federation of Labor.

SENATOR MURRAY: As I understand, under the Works Progress Administration at the present time there is no provision for prevailing wage scales; that is true, is it not?

MR. CARMODY: That is true; the wage scale was really set by the Congress at what it is now.

SENATOR MURRAY: So that if we proceeded to carry out th.. construction work under the Works Progress Administration it would have to be done under the present system that the Works Progress Administration is operating under?

MR. CARMODY: Well, I am told that the language of the bill would permit changing the WPA scale to the prevailing wage scale for the specific purpose of building these hospitals. I doubt if that is a practical thing to do because one of these hospitals might be under construction in an area where the WPA has a construction project, of perhaps a different nature, but close enough so that some of the same kinds of skilled labor are working on both of them. I think to have two wage standards on a group of WPA projects would be a mistake. I don't think it is practical. If WPA labor may not be used on these hospitals, I think some of the purposes of the bill may be interfered with, namely, that they are in areas where there are not considerable numbers of skilled men, and it is possible in those areas to give work to people who need it badly, who are competent to do a good deal of this work, perhaps not all of it, because there are certain skills that require long experience and training for those skills; whoever builds the hospitals would have to go to the normal sources for those skills.

SENATOR MURRAY: It is contemplated that most of this construction work will be away from the larger communities and principally in the rural sections.

MR. CARMODY: That is my understanding.

MR. CARMODY: I hope that the bill will make reference to the fact that the construction work will be carried on under the general supervision of the Federal Works Agency. That gives flexibility to the program; it gives us a chance to work through PWA or WPA or the Public Buildings Administration. For instance, the Public Buildings Administration will certainly make some of the plans, maybe not all of them, but even if the private architects make some of the plans there will be a certain amount of supervision over that planning on the part of the Public Works Administration, which is already familiar with this program and similar programs. So if the construction work is kept within the Federal Works Agency it gives all of us a chance to work together in a much more flexible way than if it should be assigned to a specific unit in the Federal Works Agency.

Louis Simon, Supervising Architect Federal Works Agency

MR. SIMON: The question of the costs of these hospitals is one that requires a little explanation in that there are a number of intangible elements which enter into the cost of a building before you know where it is going. There are things like the question of the difference in the labor market and the material market in different parts of the country; the question of whether it is in a rural community where all the outside utilities like the sewers and water and electricity, and everything, cost more than they would under other circumstances, if you had to dig wells, and so forth, for the water. It is a question of the climate, where the heating apparatus would be more expensive in a very severe climate than it would be in a mild climate. Then the topography and the soil that you are building on. If it is full of rocks, that is one thing for the foundation; if it is a very easy soil to dig, it is very much less expensive. So with that explanation I thought that perhaps we might put into the record, if agreeable to the Chairman, a statement that you could enter into the record that would put it before you in as comprehensive a way as possible.

SENATOR MURRAY: We would be glad to have it.

MR. SIMON: In the meantime, I may say in going into this thing we worked on the basis of hospitals of three different capacities, fifty beds, eighty beds and 100 beds. Now, as you probably know, as you increase the number of beds the cost per bed decreases because there are certain features of a hospital, such as the operating room, that will take care of eighty people as well as fifty patients. And there are certain other things that are the same up to a certain point. The size of a kitchen for fifty patients would not differ greatly from the size of a kitchen for eighty patients. And there are a number of things like that. So that the cost per bed reduces as you increase the number of beds. We have figured with the work done by the WPA, the labor being furnished by the WPA and the material being furnished by purchase, for a fifty bed hospital is $71,000 for material only, exclusive of equipment; say $80,000 including the equipment. For an eighty bed hospital it is $81,000 for material, exclusive of equipment, and we add about $350 a bed for equipment of a hospital of that size, which brings that up to $109,000. For a 100 bed hospital it is the same for the building material but $30,000 for the equipment, which brings it up to $111,000. Now that doesn't sound very logical that the construction of

the building itself for an eighty bed hospital is the same as the construction of the building for a 100 bed hospital. But in this case it is a fact for this reason: In the eighty bed hospital there were furnished extra quarters for the local health officers, which, as I understand it, the Public Health Service thinks might be a good thing but perhaps not absolutely necessary. In the 100 bed hospital they took exactly the same size building, put the health officers outside and let them find their own quarters, and added twenty more beds.

Senator Murray: There has been some question raised during the hearings regarding the advisability of having the health department in the hospital building.

Mr. Simon: Yes, sir. We also thought the committee might want to have the cost as related to material only, plus WPA labor, translated into the cost that would probably be required in case it was done by a contract, which is the more usual way and which expresses the cost per bed in a way that it is usually expressed. So I would also include that in my statement, if it is agreeable to the Chairman.

Senator Murray: That is perfectly agreeable. If this work was done by contract it would be very greatly in excess of the cost if done by relief labor under the Works Progress Administration, would it not?

Mr. Simon: It would cost a little more, but I don't think greatly in excess, sir, depending on conditions and the labor market in the particular place. I think it gives you the general picture except to say that those costs, on a basis of contract, figure up roughly to $4,000 a bed for a fifty bed hospital and $3,100 for an eighty bed hospital, and about the same for a 100 bed hospital. Now those prices can just be carried up or down, depending on what kind of a building you want. Some hospitals have been built where there are costs of $5,000, $6,000, $7,000 and more. Some of the big New York hospitals have costs of $10,000 a bed, but this isn't that kind of arrangement.

Senator Murray: If these hospitals were all built on a standardized plan, they could be built much more cheaply than if each one were built as an independent unit?

Mr. Simon: It enables the same amount of study to work them down to a standard practice, which certainly does result in a reduced cost.

Col. Francis C. Harrington, Commissioner of Work Projects of the Federal Works Agency

Colonel Harrington: The President's message of January 30 contemplated or suggested the use of WPA labor in the construction of these hospital units, and I should like to make the general statement that the WPA can undertake the execution of this program or such part of it as may be desired. We have constructed buildings of this size in practically all parts of the United States. They have been schools, armories, courthouses and buildings of that nature; and assuming the continuance of WPA, certainly through the next fiscal year, on approximately the same basis as at present, the WPA could carry out this program. In connection with Mr. Simon's testimony, which just preceded mine, he referred to the cost of building these hospitals by contract. It was not made quite clear that if they were built by contract the entire cost of each unit would have to come out of the special appropriation which your committee is considering; whereas, if built by WPA labor, approximately 50 to 60 per cent of the cost would come out of the appropriation and 40 to 50 per cent of the cost would be put in as WPA labor from the WPA appropriation. In other words, the use of WPA labor in connection with this project would merely double the amount of construction that could be provided with any size of special appropriation. We estimate roughly that the division of funds between WPA and these specially appropriated funds would be about half and half, exclusive of certain special equipment such as operating room equipment and things of that kind.

The procedure under which the WPA would operate projects would be that a project would be sponsored by the Public Health Service and the plans would be provided by the Public Buildings Administration, and the WPA would become the constructing agency.

The question was brought up of certain specialized types of labor that might not be available in rural communities, and from an operating standpoint I would say that, where those types of labor were not available, as a general matter you would contract those items of work. For example, if you had an elevator to install and you did not have the mechanics in the community who were familiar with that work, you would in all probability buy the elevator installed under a contract and let the successful bidder do that job. And the same thing is true of certain other specialized things that would go into the building.

But in the consideration of the design of these hospital units the question of the availability of highly skilled labor has been taken into consideration, and the type of building that is being studied is a type that can be built with the labor that is usually available; that is, consideration is being given to monolithic concrete construction, which does not require bricklayers or tile setters. And I should like again to make the general statement that the WPA can carry out this program if it is desired.

In that connection there are two provisions in the current WPA act for which exemption should be provided in the act authorizing this appropriation. The first one is a provision that the WPA cannot construct any building as a federal project at a total cost of more than $50,000. That is section 12 of the emergency relief appropriation act of 1939. And an exemption to that proyision or requirement would have to be inserted in the act making this appropriation. The second provision of the current WPA act is section 1(c), which provides that in any state we cannot expend more than $6 per man per month for purposes other than labor; that is, for the purchase of materials or the rental of equipment; and an exemption to that requirement should also be inserted in any act making this appropriation. I should be very glad, if the committee desires, to submit a draft of the language that is necessary in that connection, which will be very simple.

Senator Murray: We will be very glad to have that. If an exemption is provided on that point, what would be the extent to which the exemption would go?

Colonel Harrington: On the $6 item?

Senator Murray: Yes.

Colonel Harrington: Tentatively, in discussions with the Public Buildings Administration, we have contemplated that we might go to $12 a man per month in nonlabor expenditures.

Senator Murray: Have you any other statement to make in this connection?

Colonel Harrington: No, Mr. Chairman.

Senator Thomas: Colonel, we have now had WPA for several years. What is happening to the persons who are working under the WPA arrangement; are they learning how to work? In changing from job to job is there any development in their craft or skill?

Colonel Harrington: A good many of them have learned skills on WPA projects, and the personnel of WPA is continuously changing. We have at work today about 2,300,000 people on WPA, but since WPA was established on July 1, 1935, we estimate that about 8,000,000 different people have been employed, 8,000,000 different individuals. Furthermore, during the present fiscal year in the months of July and August we were required by law to remove from WPA all persons who had been employed for eighteen months, and in accordance with that provision we did remove about 775,000 people from the WPA rolls, some of whom have since come back but who could come back only after a period of at least thirty days, and after reinvestigation of their need for employment.

Senator Thomas: Do you think that it is preparing them for other employment, contributing to their other employment, developing the individual man?

Colonel Harrington: Very definitely I think so. It is either teaching them to do things or it is conserving their

capacity to do things at what they know how to do, and preventing them from deteriorating from idleness.

SENATOR MURRAY: You have had no difficulties in connection with your program of buildings in the various sections of the country; you have been very successful, have you not, in the character of construction that has been done on courthouses and schools, and so forth?

COLONEL HARRINGTON: Yes, Senator, we have done buildings of almost every character, running from the hangars at LaGuardia Airport in New York City, which cost over $1,000,000 apiece, down to $5,000 buildings of various kinds in the rural communities. We have done practically every type of construction. We probably never had as favorable a project as this presented, the favorable things being that these buildings can be designed with a standard of uniformity which will be very helpful in building them and of a type of construction which is suited particularly to the labor that we generally have available.

SENATOR MURRAY: Well, the work that you have already done would indicate that you would have the capacity for handling a job of this kind.

COLONEL HARRINGTON: Very definitely, I think so; yes, sir.

MR. CARMODY (resuming): Out of considerable experience in the construction industry, and out of a very intimate experience in the building of rural electrification lines, I hope that the bill will be kept simple and flexible and workable. Under the Rural Electrification Act, which is a simple act, we were allowed to do the work in the way that would give the greatest economy and the greatest satisfaction to the people that were paying for it, namely the farmers. We did some of it by contract, we did some of it by force account. On our force account work we got unit costs that enabled us in our subsequent contracts with the contractors to get very much better prices for better work, and for work that was performed more rapidly. So whatever we do in this bill, let's keep it simple and let's not put too many barriers in the way of getting low costs without at the same time tearing down standards of workmanship and standards of wages, and when I say "standards" I mean WPA standards, because those standards for a certain kind of work and for certain classes of people have been set by the Congress itself.

[At the direction of Senator Murray, the following document was incorporated in the record:]

CONGRESS OF INDUSTRIAL ORGANIZATIONS
1106 Connecticut Avenue N.W.,
Washington, D. C.

Office of
General Counsel March 16, 1940.

Honorable James E. Murray,
Senate Office Building
Washington, D. C.

Dear Senator Murray:

On behalf of the Congress of Industrial Organizations we desire to express our support for S. 2230, providing for an appropriation of $10,000,000 to be used for the construction of hospitals throughout the country by the federal government and thereafter to be owned by the federal government, although operated by state agencies. We believe this bill should contain a guaranty that in the administration of these hospitals there will be no discrimination against patients on account of race, color, creed or any other reason.

In expressing our approval of this bill we wish to make it clear that we feel that the relief granted by S. 3230 is totally inadequate to meet the need for hospital services. This need has been amply demonstrated by the studies conducted by the President's Interdepartmental Committee to Coordinate Health and Welfare Activities. S. 3230 makes no effort to deal with the basic problem of providing adequate medical care for those of our citizens who are unable to afford any medical care whatsoever, or the cost of medical care as it now prevails.

We therefore respectfully urge this committee to report out favorably at this time S. 1620, the National Health Bill, on which hearings have been held and a preliminary report issued by your subcommittee. S. 1620 marks the beginning in the establishment of a sound health program and has received the complete endorsement of the C. I. O. at its two conventions.

LEE PRESSMAN, General Counsel.

[Statements were presented also by the National Association of Colored Graduate Nurses, Inc., and by the American Optometric Association.]

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1461 has been reported to the Senate proposing that retired enlisted men of the Army, Navy, Marine Corps and Coast Guard when hospitalized or domiciled in either an Army or Navy hospital or United States Naval or United States Soldiers' Home shall be extended treatment or domiciliary care without cost. H. R. 9209 has passed the House, making appropriations for the Military Establishment for the fiscal year ending June 30, 1941. This bill includes an appropriation of $130,000 for the preparation of plans for a new building to house the Army Medical Library and Museum.

Bills Introduced.—H. R. 9202, introduced by Representative Gross, Pennsylvania, proposes to authorize the President, in the name of Congress, to present a medal of honor to Dr. George E. Holtzapple, "who administered oxygen in the treatment of pneumonia for the first time on record March 6, 1885." H. R. 9215, introduced by Representative Green, Florida, proposes to direct the Administrator of Veterans' Affairs to furnish to any child under 21 years of age of a veteran of the World War who contracts any disease from such veteran the same domiciliary care and medical and hospital treatment as would be furnished such veteran suffering from such disease. H. R. 9221, introduced by Representative McCormack, Massachusetts, proposes to establish in the Department of Labor a Bureau for the Welfare of the Deaf. This bureau would be authorized (*a*) to collect, tabulate and make public statistics pertaining to the deaf, their employment, and their welfare; (*b*) to ascertain what fields of employment are available to the deaf, and to endeavor to create new fields of employment; (*c*) to acquaint employers in private industry with the special capabilities of the deaf and to encourage the employment of the deaf on an equal basis with the hearing; (*d*) to cooperate with the heads of the various departments of the government, with the Civil Service Commission and states and political subdivisions in expanding the opportunity for the employment of the deaf in public service, and (*e*) to cooperate with any public or private agency in the vocational rehabilitation of the deaf. The bill is pending in the House Committee on Labor.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 3720, introduced by Senator Bilbo, Mississippi, proposes to establish a Board of Funeral Directors and Embalmers for the District of Columbia and to prescribe its powers and duties.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced.—S. 166 proposes to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic. The bill proposes to define chiropractic as "the science, art and philosophy of things natural; a system of adjusting the vertebral column and of the tissues adjacent thereto by hand for the removal of nerve interference thereby to eliminate the cause of disease." A licentiate is to have the right to examine patients and to diagnose any disease, pain, injury, deformity or physical condition and to prescribe or regulate the dietary, sanitary and hygienic habits of the patient. S. 177, to amend the medical practice act, proposes to permit the board of medical examiners to examine an applicant who submits satisfactory evidence that he has pursued and completed a course of study in a foreign country that would entitle him to licensure in that country except for the fact that the laws of that country require licentiates to be citizens thereof.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

State Medical Meeting at Tucson.—The meeting of the Arizona State Medical Association will be held at Tucson, April 17-20, with headquarters at the Santa Rita Hotel and under the presidency of Dr. Charles S. Smith, Nogales. Included on the program are:

Dr. William S. Middleton, Madison, Wis., Masquerades of Bronchiogenic Carcinoma.
Dr. Hans Lisser, San Francisco, Some Clinical Experiences with Newer Sex Hormones.
Dr. Maurice L. Tainter, San Francisco, The Clinical Value of the New Benzedrine and Ephedrine-like Drugs.
Dr. John Shelton Horsley, Richmond, Va., Cancer of the Stomach and Small Intestine.
Dr. Charles F. McKhann, Boston, Progress in the Control of Communicable Disease.
Dr. Edward L. Dorsett, St. Louis, Toxemias of Pregnancy.
Dr. Samuel D. Ingham, Los Angeles, Relationship of Neurology to Other Departments of Medical Practice.
Dr. Thomas J. Harris, New York, Treatment of Acute and Chronic Sinusitis.

Dr. Charles A. Dukes, Oakland, Calif., president of the California Medical Association, will give a public address Thursday evening on "Voluntary Budgeting for Medical and Hospital Needs and the Dangers of Compulsory Insurance Politically Controlled." All the out of state speakers will conduct round table luncheons. Arizona physicians on the program are:

Dr. John E. Bacon, Miami, Forty Years of Industrial Surgery.
Dr. Henry G. Williams, Phoenix, A Practical Procedure in the Treatment of Fistulas of the Small Intestine.
Dr. Thomas H. Bate, Phoenix, Bronchial Obstruction.
Dr. E. Payne Palmer, Phoenix, Acute Abdominal Emergencies.

A series of extension lectures on pediatrics, gynecology and obstetrics will be conducted immediately following the annual meeting of the state medical association. The lectures will be under the auspices of the maternal and child health division of the state department of health in cooperation with the association's committee on maternal and child health. Dr. McKhann and Dr. Dorsett will be the speakers.

CALIFORNIA

Society News.—Dr. Meyer Wiener, St. Louis, discussed "Problems in Surgical and Medical Ophthalmology of Interest to the Medical Practitioner" before the Hollywood Academy of Medicine, March 14.——Dr. Hale F. Shirley, San Francisco, discussed child guidance problems at a dinner of the San Mateo County Medical Society, San Mateo, March 27. ——The urologic section of the Los Angeles County Medical Association and the Clinical and Pathological Society, Los Angeles, were addressed at a joint meeting, March 28, by Dr. William F. Braasch, Rochester, Minn., on "Hypertension and the Surgical Kidney."

New Physicians' Aid Association.—The Los Angeles County Physicians' Aid Association has been organized to provide aid to worthy needy members of the profession. The new aid association is not an insurance company and is not the responsibility of the Los Angeles County Medical Association but aims merely to supplement assistance from other sources and to provide necessities not already covered. On the board of directors are Drs. Elizabeth M. Hohl, Olga McNeile, Alfred R. Robbins, Victor J. Sprauer, Philip J. Cunnane, Herbert O. Barnes and Arthur Elmer Belt. The new organization has been achieved by the committee on relief and fraternal relations of the county medical association, which has in the past been caring for eighty-one members and their dependents.

COLORADO

Dr. Hagerman Named Warden at New Institution.—Dr. Robert P. Hagerman, chief medical officer at the U. S. Penitentiary, Atlanta, Ga., has been appointed warden of a new federal correctional institution at Denver. The institution, with an ultimate capacity of 600, will receive younger, more tractable types of offenders originating in the mountain states area; it will also receive persons receiving short terms and those awaiting trial. Located on the outskirts of Denver, it was constructed at a cost of $1,500,000. It will be ready for occupancy July 1. It was one of a series of six institutions authorized for construction with PWA funds. Dr. Hagerman will take up his new work in the latter part of May. He has been a member of the U. S. Public Health Service since January 1932, when he was assigned as chief medical officer at the federal correctional institution at Fort Eustis, Va. In February 1932 he was transferred to the federal reformatory at Chillicothe, Ohio, to assume charge of the public health service activities. In July 1939 he was transferred to the Atlanta penitentiary. He graduated at the University of Maryland School of Medicine in 1923. After completing his internship he was assigned to duty at the U. S. Marine Hospital, Baltimore, where he was in charge of the urologic service until 1927.

DISTRICT OF COLUMBIA

Society News.—The Washington Ophthalmological Society was addressed, March 25, by Drs. Cecil S. O'Brien, Iowa City, on "Carcinoma of Eyelids"; Georgiana Theobald, Oak Park, Ill., "Origin of Choroidal Tumors," and Avery D. Prangen, Rochester, Minn., "Some Salient Factors in the Surgical Treatment of Extra-Ocular Muscles."——Dr. Russell L. Cecil, New York, addressed the George Washington University Medical Society, March 16, on the arthritic problem. —— Dr. Adolf Meyer, Baltimore, discussed "Essentials in the Psychoneurosis Problem" before a meeting of the naval medical and dental officers on duty in the District and vicinity, March 4.

Annual Meeting of Hospital Society.—The third annual meeting of the Medical Society of St. Elizabeths Hospital, Washington, will be held April 20. The speakers will include:

Drs. Armando Ferraro and George A. Jervis, New York, Alzheimer's Disease (The Adult Form).
Dr. Bernard Glueck, Ossining-on-Hudson, N. Y., Metrazol Shock Therapy.
Dr. Lawrence Kolb, Washington, The Personality of Drug Addicts.
Dr. Arthur P. Noyes, Norristown, Pa., Personality and Psychoses.
Dr. Winfred Overholser, superintendent, St. Elizabeths Hospital, Past, Present and Future.

At the annual dinner in the evening at the Mayflower Hotel, the Hon. A. A. Berle Jr., assistant secretary of state, will speak.

ILLINOIS

Personal.—Dr. Mary R. McConahy, oldest alumna of the University of Michigan Medical School, Ann Arbor, recently observed her one hundredth birthday at the Presbyterian Home, Evanston. She graduated in 1890.

Society News.—Dr. Joseph C. Jaudon, St. Louis, discussed the care of the newborn before the Adams County Medical Society, Quincy, February 12.——Dr. Milton C. Winternitz, New Haven, Conn., conducted a clinic and discussed "Problems of Vascular Pathology" before the Peoria City Medical Society, March 5. Dr. Clifford U. Collins addressed the society, March 19, on medicolegal problems.——Dr. Meyer Brown, Chicago, addressed the Madison County Medical Society, Granite City, March 1, on "Headache, Including Migraine."

Postgraduate Conference.—The Illinois State Medical Society will sponsor a postgraduate conference in the assembly hall of the Dixon State Hospital, Dixon, April 18. The following program has been arranged:

Dr. Julius H. Hess, Chicago, Bronchiectasis in Childhood.
Dr. Charles M. McKenna, Chicago, Some Problems in the Diagnosis of Renal Tumors.
Dr. Francis E. Senear, Chicago, Diseases of the Skin.
Dr. Delmas K. Kitchen, Detroit, Diagnosis and Therapy of Sexual Immaturity.
Dr. Warren G. Murray, Dixon, Interesting Cases Shown by Staff Members of the Dixon State Hospital.
Dr. Carl V. Moore, St. Louis, Differential Diagnosis and Treatment of the Hemorrhagic States.
Dr. Charles B. Puestow, Chicago, Influence of Drugs on Intestinal Motility.
Dr. Harold D. Palmer, Rockford, Clinical Pathology of the Kidney.
Dr. Charles F. Sawyer, Chicago, Biliary Tract Disease.
Dr. Robert S. Berghoff, Chicago, Thyroid Heart Disease and The Diseased Gallbladder and Its Relation to Heart Disease.

Chicago

University News.—Dr. Burrill B. Crohn, New York, lectured at the University of Illinois College of Medicine, March 2, under the auspices of Alpha Omega Alpha, on "Peptic Ulcer."

Session on Infant and Maternal Mortality.—The Chicago Medical Society will devote its meeting on April 17 to a discussion of "Infant Mortality in Chicago 1935-1939" by Dr. William I. Fishbein. Drs. Luella E. Nadelhoffer and Julius Hess will discuss "Maternal Mortality in Chicago 1935-1939." A clinical meeting will be held at the Chicago Lying-In Hospital in the morning and afternoon while the evening session will be at the Chicago Woman's Club.

Special Lectures.—J. Christian Bay, librarian of the John Crerar Library, will give an address in the assembly room of the Institute of Medicine of Chicago, 86 East Randolph Street, at 8 o'clock, April 16, under the auspices of the Society of Medical History of Chicago. He will discuss "Men, Method, and Memory in Scientific Progress." Dr. M. Ruiz Castañeda, department of medical research, General Hospital, Mexico City, will give an illustrated lecture at a joint meeting of the Institute of Medicine of Chicago, the Chicago Society of Internal Medicine and the Chicago Pathological Society, April 29, at the Palmer House, on "Recent Advances in Research on Typhus in Mexico." The second Ernest Edward Irons Lecture was delivered at Billings Hospital, March 26, by Dr. David P. Barr, Busch professor of medicine, Washington University School of Medicine, St. Louis, on "The Nature of Obesity." Dr. Edward W. Archibald, emeritus professor of surgery, McGill University Faculty of Medicine, Montreal, Que., will deliver the sixteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation before the Institute of Medicine of Chicago, April 26. His lecture will be entitled "Discussion of the Theories Concerning the Causation of Acute Pancreatitis."

MASSACHUSETTS

Lecture on Medical Ethics.—The George W. Gay Lecture on Medical Ethics was delivered at Harvard Medical School, Boston, March 19, by Mr. Phillipps Ketchum, Boston, on "How Does a Doctor Spend His Money?"

Alumni News.—Plans to observe the twenty-fifth anniversary of the class of 1915 of Harvard Medical School were initiated at a recent meeting in Boston. Dr. Fabyan Packard is chairman of the committee on arrangements.

MICHIGAN

Dinner in Honor of Dr. Shurly.—A testimonial dinner will be held in the Masonic Temple, Detroit, April 25, in honor of Dr. Burt R. Shurly. On this occasion Dr. Shurly will be presented with the gold medal awarded him by the American Academy of Ophthalmology and Otolaryngology at its 1939 annual session for noteworthy contributions to the knowledge of nose and throat disorders. Dr. Ralph H. Pino, president of the Wayne County Medical Society, will make the presentation address. Many local agencies are sponsoring the dinner. Dr. Shurly graduated at the Detroit College of Medicine and Surgery in 1895. In 1913 he bought the school to save it from probable dissolution and later gave it to the city. He was dean of the school until he left for France with the American Expeditionary Forces in 1918. Dr. Shurly has served as president of the American Laryngological Association, the American Laryngological, Rhinological and Otological Society, the American Academy of Ophthalmology and Otolaryngology and the Detroit Academy of Medicine. He was secretary of the Section on Laryngology, Otology and Rhinology of the American Medical Association from 1911 to 1913 and chairman, 1913-1914. He has served as a member of the House of Delegates of the Association since 1922.

MINNESOTA

State Medical Meeting at Rochester.—The eighty-seventh annual session of the Minnesota State Medical Association will be held at the Mayo Civic Auditorium, April 22-24, under the presidency of Dr. Bertram S. Adams, Hibbing. Headquarters will be the Kahler Hotel. Dr. Nathan B. Van Etten, New York, President, American Medical Association, will address an evening session of the house of delegates Sunday evening on "An American Health Program." Out of state speakers will include:

Dr. Paul B. Magnuson, Chicago, Fracture of the Neck of the Femur.
Dr. Florian E. Schmidt, Chicago, Treatment of Scarlet Fever.
Dr. Harry E. Mock, Chicago, Skull Fractures and Cerebral Injuries.
Dr. Anthony J. Lanza, New York, Pneumoconiosis.
Dr. John O. Bower, Philadelphia, Clinical and Surgical Aspects of Spreading Peritonitis Complicating Acute Perforative Appendicitis.
Dr. Fred L. Adair, Chicago, Prevention and Treatment of Genital Prolapse.
Dr. Norman H. Jolliffe, New York, Clinical Aspects of Vitamin B Deficiencies.
Dr. Paul L. Schroeder, Chicago, Emotional Factors in Organic Disease.

Dr. Bernard H. Nichols, Cleveland, will deliver the Russell D. Carman Memorial Lecture, sponsored by the Minnesota Radiological Society, on "Indications for the Use of Excretory Urography in Diagnosis." Dr. Russell L. Cecil, New York, will deliver the Mayo Foundation Lecture on "Present Trends in the Study of Arthritis and Rheumatism." A symposium on fractures will be presented by Drs. Mark H. Tibbetts, Duluth, Manford O. Oppegaard, Crookston, and Otto W. Yoerg, Minneapolis. At the annual banquet the Southern Minnesota Medical Association will award its medal to the physician presenting the best scientific exhibit, and the speakers will include the Hon. Harold E. Stassen, governor of Minnesota, and Mr. Bernard H. Ridder, publisher of the St. Paul *Dispatch* and *Pioneer Press*, whose subject will be "How the Peace of the World Was Lost."

MISSOURI

New Health Units.—Full time health units were recently established in Jasper and Pemiscot counties, bringing to a total of eight the number of counties with units subsidized in part by funds from the state board of health. Webb City is headquarters for the Jasper County unit and Caruthersville for Pemiscot County.

Portrait of Dr. Ravenel.—Former students of Dr. Mazyck P. Ravenel, professor emeritus of medical bacteriology and preventive medicine, University of Missouri School of Medicine, Columbia, are presenting an oil portrait of him to the university, newspapers reported. The painting was done in Kansas City by Albert Adams Sloan and will be presented formally later in the year. Dr. Ravenel was active at the medical school from 1914 to 1936.

Academy of Science Meets with Medical Profession.—The medical section of the Missouri Academy of Science will meet jointly with the Sixth Councilor District of the Missouri State Medical Association at the Central Missouri State Teachers College, Warrensburg, April 18-19. The speakers will include:

Dr. Edwin H. Schorer, Kansas City, Rationale of Public Health Development.
Dr. Claude R. Bruner, Columbia, Sinusitis.
Dr. James R. McVay, Kansas City, Cancer of the Gastrointestinal Tract.
Dr. Cyrus E. Burford, St. Louis, Urinary Stasis, A Common Cause of Destructive Tissue Change, Stone Formation and Bacterial Invasion.
Dr. Quitman U. Newell, St. Louis, Retrodisplacement of the Uterus.
Dr. Alphonse McMahon, St. Louis, Aminophylline, Its Uses and Its Effect Upon the Electrocardiogram.
Dr. Richard L. Sutton, Kansas City, Acne Vulgaris; New Concept of Etiology; Effective and Dependable Treatment; Acne Vulgaris; A Disturbance of Lipoid Metabolism.

The annual banquet of the academy of science will be addressed by Dr. McMahon on "What the Medical Profession is Doing to Care for Its Own Problems" and Edwin R. Walker, Central College, Fayette, "Philosophy and Science." Additional information may be obtained from Ray T. Dufford, Ph.D., 212 Physics Building, Columbia.

NEBRASKA

State Medical Meeting in Omaha.—The Nebraska State Medical Association will hold its annual session in Omaha, April 22-25, under the presidency of Dr. Arthur L. Miller, Kimball. The scientific program will open Tuesday morning with a symposium on obstetrics, presented, among others, by Drs. Carl P. Huber, Indianapolis; Morris Edward Davis, Chicago, and Willis E. Brown, Ann Arbor, Mich. A symposium on psychiatry will be presented Thursday afternoon by Drs. George A. Young, Richard H. Young, and Wilbur A. Muehlig, Omaha; Juul C. Nielsen, Ingleside, and Harold Douglas Singer, Chicago. Other speakers will include:

Dr. Stuart W. Harrington, Rochester, Minn., Cancer of the Breast.
Dr. Theodore E. Sanders, St. Louis, Management of Ocular Trauma, with Particular Reference to Emergency Treatment.
Dr. Ernest E. Irons, Chicago, Non-Pneumococcal and Non-Tuberculous Pneumonias.
Dr. Nathan B. Van Etten, New York, Progress of Social Hygiene (round table discussion).
Dr. Armand J. Quick, Milwaukee, Therapeutic Value and Limitations of Vitamin K.
Dr. Ira H. Lockwood, Kansas City, Mo., Clinical and Roentgenologic Manifestations of Low Back Pain.
Dr. Warren H. Cole, Chicago, Present Day Concepts in Handling Gallbladder Disease.

Entertainment will include a golf tournament, trap shoot and various alumni luncheons. The annual dinner Tuesday evening will be addressed by Dr. Edward J. McCormick, Toledo, Ohio, on "Present Social Trends and the Future of Medicine."

NEW YORK

New Regulations for Hotel Sanitation.—The Public Health Council has adopted amendments to the Sanitary Code requiring adequate maintenance of sanitary conditions in hotels, lodging houses and boarding houses, effective April 1. The regulations do not apply to hotels, lodging houses and board-

ing houses that are connected with both public water supplies and public sewerage systems. Establishments to which they do not apply are required to be equipped with adequate and safe supplies of drinking water and approved toilet and sewage disposal facilities. Other provisions of the new rules refer to the protection of food supplies, dish washing facilities and the reporting of suspected cases of communicable disease or unusual prevalence of illness.

Lectures for Practitioners.—The council committee on public health and medical education of the Medical Society of the State of New York is sponsoring two postgraduate courses during the spring. A course on hemorrhage arranged for the Tioga County Medical Society and presented in Owego and Waverly has the following speakers, all of the faculty of Long Island College of Medicine, Brooklyn:

Dr. Richard H. Bennett, Pulmonary Hemorrhage, March 20.
Dr. Albert F. R. Andresen, Gastrointestinal Hemorrhage, March 27.
Dr. Mervyn V. Armstrong, Hemorrhages of Pregnancy, April 3.
Dr. Fedor L. Senger, Hematuria, April 10.
Dr. Vincent R. Mazzola, Uterine Hemorrhage, April 17.

The other course is being presented for the Fulton County Medical Society at Gloversville by members of the faculty of New York University College of Medicine:

Dr. Irving Graef, Cardiac Structure and Its Disorders, March 29.
Dr. Charles E. Kossmann, Cardiac Functions and Their Disorders, April 5.
Dr. Currier McEwen, Rheumatic Fever and Rheumatic Heart Disease, April 12.
Dr. William Goldring, Hypertension and Hypertensive Heart Disease, April 19.
Dr. Clarence E. de la Chappelle, Syphilitic and Arteriosclerotic Heart Disease, April 26.

New York City

Dr. Carey Will Give Brickner Lecture.—Dr. Eben J. Carey, dean and professor of anatomy, Marquette University School of Medicine, Milwaukee, will deliver the ninth Walter M. Brickner Lecture of the Hospital for Joint Diseases, New York, April 26. His subject will be "The Dynamics of Skeleto-Muscular Deformities."

Seventh Harvey Lecture.—Dr. Joseph T. Wearn, professor of medicine, Western Reserve University School of Medicine, Cleveland, will deliver the seventh Harvey Society Lecture of the current series at the New York Academy of Medicine, April 18. His subject will be "Morphological and Functional Alterations of the Coronary Circulation."

Lectures on Vitamins.—Mount Sinai Hospital is presenting a series of lectures on vitamins during April and May as follows:

Selig Hecht, Ph.D., Vitamin A and Vision, April 4.
Dr. Norman H. Jolliffe, Clinical Aspects of Vitamin B Deficiencies, April 17.
Dr. Albert M. Snell, Rochester, Minn., Physiologic and Clinical Significance of Vitamin K, April 18.
Dr. Gilbert Dalldorf, Valhalla, N. Y., Vitamin C, April 23.
Dr. Hans P. Popper, Chicago, Vitamin A, April 25.
Dr. Alwin M. Pappenheimer, Lesions of the Nervous System and Skeletal Muscles in Diet Deficient in Vitamin E, May 14.
Dr. Benjamin Kramer, Brooklyn, Vitamin D—Formation, Clinical Pathology and Therapeutic Indication, May 21.
Dr. William H. Sebrell Jr., Washington, D. C., Riboflavin, May 24.

NORTH CAROLINA

New Laboratory Dedicated.—A new $200,000 building for the state laboratory of hygiene was dedicated in Raleigh, February 21, in memory of the late Dr. Clarence A. Shore, who organized the laboratory and directed it from 1908 to 1933. Speakers at the ceremony included Governor Hoey; Drs. John A. Ferrell, New York, associate director of the International Health Division of the Rockefeller Foundation; Sylvester D. Craig, Winston-Salem, president of the state board of health; John H. Hamilton, present director of the laboratory; Carl V. Reynolds, state health officer, and George M. Cooper, director of the division of preventive medicine, state health department.

OHIO

Changes in Health Officers.—Dr. Benedict B. Backley, Jacksonville, has been named health commissioner of the new combined Athens city and county health unit.——Dr. Francis R. Neff, London, has been appointed health commissioner of Madison County.

Annual Postgraduate Day.—The Mahoning County Medical Society will present its annual Postgraduate Day at the Ohio Hotel, Youngstown, April 24. The lecturers, all of Baltimore, will be:

Dr. Warfield M. Firor, Prevention and Treatment of Tetanus.
Dr. Richard W. TeLinde, Causes of Postmenopausal Bleeding.
Dr. Benjamin M. Baker Jr., the Effect of Treatment of Headache.
Dr. Lloyd G. Lewis, Urologic Significance of Hematuria.

District Meeting.—A meeting of the ninth councilor district of the Ohio State Medical Association was held in Jackson, March 7, with the following speakers, among others: Drs. Parke G. Smith, Cincinnati, president of the state association, on "Present Trends in Organized Medicine"; Jean P. Pratt, Detroit, "Role of the Endocrine in Gynecology," and Daniel P. Foster, Detroit, "Problems in the Management of the Diabetic Patient."

Society News.—Dr. Gabriel Tucker, Philadelphia, addressed the Mahoning County Medical Society, Youngstown, February 20, on diagnosis and treatment of tumors of the larynx.——Dr. George T. Pack, New York, addressed the Montgomery County Medical Society, Dayton, March 15, on "Diagnosis and Treatment of Tumors of the Stomach, Colon and Rectum."——Dr. Alfred W. Adson, Rochester, Minn., addressed the Academy of Medicine of Toledo and Lucas County recently on "Chronic Recurring Sciatica Due to a Rupture of the Intervertebral Cartilage, with the Protrusion of the Nucleus Pulposus: Differential Diagnosis and Treatment."——Dr. Howard F. Root, Boston, addressed the Academy of Medicine of Cincinnati, March 19, on "Basic Principles in the Dietary Management of Diabetes Mellitus." Dr. Arthur C. Christie, Washington, D. C., was the speaker, March 5, on "The Diagnosis and Management of Cancer of the Breast."

An Osteopath Candidate for Coroner.—According to the April issue of the *Ohio State Medical Journal*, an Ohio osteopath initiated steps to have his name placed on the ballot at the Democratic primary election to be held in May as a candidate for the office of coroner for Darke County. The law provides that no person other than a licensed physician shall be eligible to the office of coroner in any county, with an exception not pertinent in this instance. A question was raised as to whether osteopath Kester was eligible to the office and the matter was submitted to the attorney general. In the opinion of this official, the word "physician" as used in the coroner law refers to a person licensed to practice medicine, and since the practice of medicine as ordinarily and popularly understood not only requires a knowledge of disease and its origin but in addition a knowledge of drugs, their preparation and action, an osteopathic physician, being by law denied permission to prescribe or administer drugs except anesthetics and antiseptics, is not eligible to the office of coroner. Osteopath Kester, understandably perhaps, was dissatisfied with the ruling of the attorney general and has filed an action in the Supreme Court of Ohio for a writ of mandamus to compel the Darke County Board of Elections to place his name on the ballot.

PENNSYLVANIA

Society News.—Dr. Earl D. Osborne, Buffalo, addressed the Lycoming County Medical Society, Williamsport, March 8, on "Newer Drugs in the Treatment of Syphilis and the Successes and Failures of Syphilis Programs" and Dr. Albert F. Doyle, Johnstown, of the state department of health, on "Recent Legislation Against Syphilis."——Dr. Dickinson Sergeant Pepper, Philadelphia, addressed the Washington County Medical Society, Washington, March 13, on "The Use of Sulfapyridine in the Treatment of Pneumonia."

Philadelphia

Gift in Honor of Dr. Pfahler.—The Philadelphia Roentgen Ray Society has contributed $1,000 to the library of the College of Physicians of Philadelphia, the interest to be applied to the purchase of books on radiology. This gift is to be known as the "Fund of the Friends of George E. Pfahler." The fund was made up of the receipts over the expenses for a recent testimonial dinner for Dr. Pfahler, augmented by the society to make the full amount.

Society News.—Drs. Richard L. Masland and Bernard J. Alpers, among others, addressed the Philadelphia Pediatric Society, March 12, on "The Use of Dilantin in Epilepsy in Children" and "Brain Tumors in Infancy and Childhood" respectively.——Dr. Norman R. Ingraham Jr. addressed the American Society for the Study of Social and Criminal Delinquency, March 12, on "The Legal Aspects of Venereal Disease Control."——Dr. William E. Ehrich, among others, addressed the Pathological Society of Philadelphia, March 14, on "Some Common but Infrequently Recognized Lesions of the Mouth and Pharynx."

Annual Postgraduate Institute.—The Philadelphia County Medical Society will present its Fifth Annual Postgraduate Institute at the Bellevue-Stratford Hotel, April 15-20. The general subject to be treated will be "Cardiology, Vascular and Nephritic Diseases." Seventy-five different specialists will conduct the courses. The registration fee is $5. Luncheon speakers

will include the Hon. Robert E. Lamberton, mayor of Philadelphia; Dr. John J. Shaw, secretary of health of the Commonwealth of Pennsylvania; Dr. Francis F. Borzell, president-elect, Medical Society of the State of Pennsylvania, and Dr. George P. Müller, president of the American College of Surgeons.

WISCONSIN

Spring Clinic Programs.—The council on scientific work of the State Medical Society of Wisconsin has arranged the second annual clinic day sessions to be held in Wausau, April 24; Watertown, April 25, and La Crosse, April 26. The morning sessions will be devoted to clinics in surgery, medicine, pediatrics and dermatology, conducted by guest speakers. Dr. Geza de Takats, Chicago, will conduct a clinic on the treatment of varicose veins; Drs. Samuel A. Levine and Merrill C. Sosman, Boston, on valvular diseases of the heart; Albert Graeme Mitchell, Cincinnati, on malnutrition, and Paul A. O'Leary, Rochester, Minn., on diseases of the skin. In the afternoons there will be addresses by the following:

Dr. William D. Stovall, Madison, Wis., (1) Practical Clinical Application of Renal Functional Tests, and (2) Clinical Interpretation of Certain Serological Tests in Diagnosis of Communicable Diseases Including Syphilis.
Dr. O'Leary, (1) Oral Bismuth and Its Place in the Treatment of Syphilis, and (2) Eczema.
Dr. Sosman, Pitfalls in Gastrointestinal Fluoroscopy.
Dr. Mitchell, Common Endocrine Disturbances in Children.
Dr. John W. Harris, Madison, Management of Common Complications of Pregnancy.

There will also be round table discussions during dinner followed by evening sessions, at which Dr. de Takats will speak on peripheral vascular disease and Drs. Levine and Sosman will conduct clinical and roentgenologic conferences on cardiology.

GENERAL

Society of Clinical Surgery—Correction.—The annual meeting of the Society of Clinical Surgery will be held in St. Louis, April 29-30, and not in Nashville, Tenn., April 14-15, as noted in THE JOURNAL, March 23. The meeting described was that of 1939, a program of which was received recently. The sessions this year will be held at the Barnes Hospital and Washington University School of Medicine, St. Louis, and will include operations, motion pictures and presentation of cases.

The Kober Lecture.—Dr. William G. MacCallum, Baxley professor of pathology, Johns Hopkins University School of Medicine, Baltimore, delivered the annual Kober lecture at Georgetown University Medical School, Washington, D. C., March 28, on "Pathology of the Parathyroid Glands." He was presented with a certificate and honorarium of $500 provided by the Kober Foundation. The speaker for this lecture is selected in alternating years by the Medical Society of the District of Columbia, the Association of American Physicians and the Association of Military Surgeons. The lecture commemorates the late Dr. George M. Kober, Washington, and is given on his birthday.

Society for Study of Asthma.—The annual meeting of the Society for the Study of Asthma and Allied Conditions will be held in Atlantic City, April 29. Among the speakers will be:

Drs. Warren T. Vaughan and David M. Pipes, Richmond, Va., A Study of Tissue Tension Responses in Urticaria and Angioneurotic Edema (the presidential address).
Drs. Robert A. Cooke, Stanley F. Hampton and William B. Sherman and Arthur Stull, Ph.D., New York, Sensitizations Induced by Tetanus Toxoid.
Dr. Stearns S. Bullen and Walter R. Bloor, Ph.D., Rochester, N. Y., A Chemical Method for Measurement of Adrenalin in the Blood.
Dr. Harry H. Donnally, Washington, D. C., Does Culture Virus (Rivers) Result in Good Immunity?
Dr. George Pincus and associates, Los Angeles, Relationships Between Foods as Shown by the Skin Test in 1,000 Children.
Drs. Louis E. Prickman and Herman J. Moersch, Rochester, Minn., The Diagnosis and Treatment of Bronchostenosis, an Important Complication of Asthma.

Grants for Research.—The Committee on Therapeutic Research of the Council on Pharmacy and Chemistry has available a fund to be expended in the promotion of investigations that may have therapeutic interest. Applications for grants are invited in this general field. The grants are limited to the purchase of materials or special apparatus. The application must contain adequate description of the research proposed, and an additional explanation if it is a continuation of an investigation which has been supported previously by some research fund. Each application must also contain a statement whether or not the work is supported in part by grants from any source other than that of the Committee on Therapeutic Research and, if so, the name of the organization making the grant and the amount of same. Applications should be sent to the secretary of the Council, Paul Nicholas Leech, 535 North Dearborn Street, Chicago, on or before May 1. To expedite transmission to members of the committee it is asked that six copies (five carbon copies) of each application be sent. Action will not be taken until after all applications are received.

Special Society Elections.—Dr. Julian L. Rawls, Norfolk, Va., was chosen president-elect of the Southeastern Surgical Congress at the annual meeting in Birmingham, March 11-13; Dr. Herbert Acuff, Knoxville, Tenn., vice president, and Dr. Benjamin T. Beasley, Atlanta, Ga., secretary, reelected. Dr. Irvin Abell, Louisville, Ky., was installed as president. The 1941 meeting will be held in Richmond, Va.——At the recent annual meeting of the Federation of State Medical Boards of the United States in Chicago, Dr. J. Earl McIntyre, Lansing, Mich., was chosen president-elect and Dr. John R. Neal, Chicago, became president. Dr. John F. Hassig, Kansas City, Kan., was elected vice president and Dr. Walter L. Bierring, Des Moines, Iowa, reelected secretary.——Dr. Stanhope Bayne-Jones, dean, Yale University School of Medicine, New Haven, Conn., was elected president of the American Association of Pathologists and Bacteriologists at its annual meeting in Pittsburgh, March 21. Other officers include Drs. Samuel R. Haythorn, Pittsburgh, vice president; Howard T. Karsner, Cleveland, secretary, and Alan R. Moritz, Boston, treasurer. The next annual session will be held at New York University, New York, April 10-11, 1941.

CORRECTIONS

Number of Births at Jamaica Hospital.—Jamaica Hospital, Jamaica, N. Y., reported 981 births for the year 1939 instead of ninety-eight, which was incorrectly reported in the Hospital Number of THE JOURNAL, March 30, page 1231.

Highest Necropsy Percentages.—The Beverly Hospital, Beverly, Mass., which reported 118 deaths and eighty-five necropsies in 1939, a rate of 72 per cent, should have been included in the list of approved internship hospitals with the highest necropsy percentages, Table F, page 1172, in the Hospital Number of THE JOURNAL, March 30.

Government Services

Report on Health of Army

As in the preceding five years, motor vehicle accidents were the leading cause of death in the United States Army in 1938, according to the annual report of the surgeon general.

Injuries of all types caused 313 deaths and diseases caused 282. The leading causes, which were responsible for 70 per cent of all deaths, were: motor vehicle accidents 89, suicides 72, air transport accidents 55, diseases of the coronary arteries and angina pectoris 48, cancer and other malignant tumors 30, accidental drowning 22, pneumonia 29, appendicitis 18, tuberculosis 17, homicides 14, apoplexy 12 and accidental falls 11.

The strength of the army in 1938 was 182,815, about 7,191 more than in 1937. The average officer strength was 11,628.

The number of admissions to sick report was 99,086, which was 9 per cent less than in 1937, although the army strength was 4 per cent greater. The rate of admission, 542 per thousand of strength, is the lowest ever recorded.

Nasopharyngitis was the leading cause of admission to sick report as it has been during the past five years. The following conditions caused 45 per cent of all admissions in this order: nasopharyngitis, athletic injuries, bronchitis, acute tonsillitis, gonorrhea, chronic tonsillitis, accidental falls, enteritis and colitis, appendicitis, acute catarrhal pharyngitis, cellulitis and trichophytosis.

Gonorrhea headed the list of causes of loss of time, as it has every year since the World War, but in 1938 the number of days for treatment, 166,369, was 15 per cent less than the number in 1937. Athletic injuries were second in order, with 86,375 days lost, 22 per cent more than in 1937. The daily noneffective rate, 27.64, was the lowest recorded since 1917.

Retirements and discharges for physical disability were responsible for the separation of 136 officers and 2,025 enlisted men from the service. Among the enlisted men, 56.6 per cent of the discharges occurred within the first year of service. Some of the disabilities were incurred after entry into the service, but not many. Experience indicates that measures necessary to exclude men with actual or potential disability would probably not be economical.

The number of cases of venereal disease, 5,594, was about 6 per cent lower than in 1937 and the rate per thousand of

strength, 30.6, was the lowest ever recorded. Twenty-six per cent of the cases were syphilis; 64 per cent were gonorrhea. The highest rate was for white enlisted men in the Philippine Islands.

There were 318 cases of dengue, all in the Philippines except one in an officer in Puerto Rico. In the Philippines dengue appears to affect white men preponderantly and malaria the Filipinos.

Thirteen cases of typhoid occurred, nine in an outbreak traced to a native carrier at Fort Mills. Pneumonia, for some years the leading cause of death among diseases, was in third place in 1938. The case fatality rate was 3.7 as compared with 6.4 the previous year.

The number of surgical operations performed in 1938 was 25,366, including those on nurses. There were 3,646 tonsillectomies, 2,124 appendectomies and 857 herniotomies.

There were eighteen officers and 639 men invalided home from overseas garrisons.

The commissioned personnel of the Medical Corps of the army was increased by fifty officers during 1938, making the authorized strength by June 30, 1939, 1,132 officers. The average enlisted strength of the medical department was 8,464. The strength of the Medical Reserve Corps on June 30, 1939, was 23,339 officers.

During the last half of the fiscal year, steps were taken to revive reserve hospital units on the basis employed during the World War, that is, as units sponsored by medical schools or large civil hospitals from which the personnel for the professional services and part of the administrative officers were drawn.

One hundred and forty-three regular army officers completed various courses of instruction at the Army Medical School, the Medical Field Service School, the Army Dental School and the Army Veterinary School and twenty-one at other service schools. Twenty-nine medical officers took training at civil institutions. In addition, 11,625 officers, enlisted men and civilian employees were enrolled in extension courses and 2,186 students in medical R. O. T. C. units.

The Army Medical Museum reported 120,018 visitors during the year besides physicians who came to study. New methods of mounting specimens for display have been successfully used, notably the use of "lucite" for unbreakable specimen jars. Several accessions were received during the year, most important of which was the Huntington anatomic collection from Columbia University. Exhibits were prepared for various medical meetings. The registry of pathology continued to be active, loan sets being in great demand.

During the fiscal year 4,527 bound volumes were added to the library and subscriptions were entered for 250 additional journals. The librarian reports that the last available space for books has been used and that no more books can be received until arrangements are made to provide more space for them. Moreover, the crowded condition and the inadequate personnel make it impossible for the library to give the service demanded by modern library science and administration.

Meeting of Advisory Cancer Council

The National Advisory Cancer Council held its twelfth quarterly meeting, March 2, at the newly completed National Cancer Institute building near Bethesda, Md. Grants-in-aid were made to the University of Chicago, $3,500 for investigation of cancer-causing substances; University of Michigan, $450 for x-ray and neutron investigations; University of Cincinnati, $4,020 for clinical studies of cancer of the stomach, and the Society of the New York Hospital, $4,400 for general studies. Tentative grants were made to the Roscoe B. Jackson Foundation, Bar Harbor, Maine, for genetic studies and to Meharry Medical College, Nashville, Tenn., for statistical studies of cancer in Negroes. Reports were presented by Carl Voegtlin, Ph.D., chief of the National Cancer Institute, on research now in progress; Dr. Roscoe R. Spencer, assistant chief, on the so-called cancer cures that the institute is asked to investigate, and Dr. George M. Smith, Pine Orchard, Conn., a member of the council, on cooperative efforts in cancer research. Dr. Ludvig Hektoen, executive director of the council, reported on projects now being undertaken with federal aid, including studies in tissue metabolism at Cornell University Medical College, New York, and experimental studies on the origin of cancer in progress at the Barnard Free Skin and Cancer Hospital, St. Louis. Other topics discussed were a study of cancer of the skin to be undertaken by the National Cancer Institute and the possibility of issuing a revised publication dealing with the relief of pain in cancer patients.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 9, 1940.

Immunization Against Diphtheria

In this country immunization against diphtheria has never been practiced on a large scale as in the United States and Canada, but a memorandum on the subject issued by the Ministry of Health is an important step in that direction. About 60,000 cases of diphtheria are notified annually in England and Wales, and the average number of deaths is 3,000. Diphtheria occupies the seventh place among the causes of mortality in the first two years of life and at 4 years becomes the principal cause and remains so for the next six or seven years. It is thus the most common cause of death in children of school age, and no abatement of incidence or permanent reduction of mortality has taken place since the early years of the century. In 1910 the incidence per hundred thousand of population was 133 and the mortality under the age of 15 was 38.4; in 1930 the corresponding figures were 184 and 34 and, in 1937, 149 and 31.

Attempts to control the spread of diphtheria by compulsory notification, removal to a hospital and disinfection of rooms and bedding, have long reached the limit of usefulness. The reason is that diphtheria is most commonly conveyed directly from an infective person by droplets of moisture discharged into the air during coughing, sneezing or even during talking. The chief source of infection is the apparently healthy "carrier." In districts where diphtheria is endemic the infection is thus disseminated with the result that a large proportion of the population become immunized before the end of school life, but at a heavy cost in sickness and mortality. On the other hand, artificial immunization, carried out with proper precautions, involves no risk. The ministry states that the experience of the United States and Canada shows that if three fourths of the children at each age below 15 were immune and if this level was maintained year by year, the disease would be practically abolished. It therefore recommends that the advantages of immunization be brought to the notice of parents of children over 1 year of age, so that they may give the requisite consent for its performance. In early infancy, apart from the first few months, when a variable degree of passive immunity may exist, there is only a feeble resistance of the cells of the mucous membranes to the implantation of the diphtheria bacillus. Artificial immunization is therefore recommended as early in life as is practicable. Adults are considered to require immunization only in exceptional circumstances. Nurses and other members of the staff of fever hospitals are now protected with excellent results. It is recommended that immunized children be given a further dose of the prophylactic when they reach school age. In routine immunization a preliminary Schick test is not considered necessary. Four forms of diphtheria prophylaxis are produced in this country but can be sold only subject to satisfying the requirements of the Therapeutic Substances Regulations as to potency and freedom from toxicity.

For children under 8 years a dose of 0.1 cc. of alum precipitated toxoid followed after four weeks by 0.5 cc. is recommended. For older children and adults the first dose of 0.1 cc. serves to detect unusual sensitiveness. Two further similar doses should then be given at intervals of two or three weeks. But, if the person is not unduly sensitive, the same procedure as for younger children should be followed. In all cases a Schick test should be done not less than two months after the last injection. It will usually be found that a few of those

given the ordinary course varying from 1 to 10 or 15 per cent are still susceptible. Such persons should be subjected to a second similar course and again tested not less than four weeks later.

PARIS

(From Our Regular Correspondent)

Feb. 25, 1940.

Trench Foot

Christian Champy and Roger Goujard discussed before the Academy of Sciences and the Academy of Medicine the role of vitamin B deficiency in trench foot, which has again made its appearance. The symmetry of the lesions, the fact that only certain army units and certain classes of troops are troubled by it, its frequency in alcoholic persons and the effect of the cold season have always pointed to an internal agent, probably vitamin B deficiency. If this assumption is true, it would account for the localization of the lesion under the influence of a physical cause acting peripherally. Unlike beriberi, trench foot is not usually accompanied with generalized neuritis. After subjecting animals to a regimen deficient in vitamin B, they exposed them to conditions similar to those of the soldiers in the trenches. Controls were used and were given the same diet but without exposure to cold. The authors found that the accidents of vitamin B deficiency appeared much earlier in animals exposed to cold. They believe that the process of thermogenesis activates a larger consumption of glucides, in the production of which, it is generally agreed, the effect of vitamin B can be recognized. The edemas of trench foot are attended by degenerative processes in the sciatic nerve, while phenomena of general neuritis are not in evidence. Their conclusion is that trench foot is preceded by a vitamin B deficiency and that the best prophylaxis consists in supplying regular doses of this vitamin. Other measures would include the elimination of tight fitting equipment and the furnishing of water tight shoes.

Leriche, who conducted studies on trench foot at the Centre de recherches de chirurgie vasculaire of Lyons, thinks that trench foot is an excellent example of a functional disorder followed shortly after by a definite anatomic condition. A large number of cases recently observed by him originated in vasomotor conditions. When men with frostbitten feet remove their boots in a warm room, a painful edema of considerable extent appears, with a rapid rise in the oscillometric index if the lesion is unilateral. This is followed by phlyctenae at the extremities of poorly vascularized toes and by stubborn gangrenes. A second observation is that of stoppage involving the arteries. Men afflicted with trench foot are arthritic to the point that long after healing they often suffer ischemic crises and cyanosis of the feet in winter. Leriche recommends infiltration anesthesia of the sympathetic nerve as a systematic treatment of urgency. Stricker and Buck obtained immediate alleviation and accelerated cures by means of lumbar infiltration.

War Psychosis

The war has not been without its effect on the minds of the French people. In one of the last sessions of the Société médico psychologique the alienists exchanged their views on the connection between mobilization, war and psychopathic reactions. Cases at the outbreak were rare and mostly of a hallucinatory character. Most of them were cured after shorter or longer isolation. Among them were a certain number (four out of eighty-two according to the statistics) who showed a mental condition due either to the war or to events that had activated their dementia or developed incidents that justified their isolation. Those hospitalized showed only transient excitements. In general, they were indifferent and many even denied the existence of the war. War, accordingly, did not appreciably modify psychopathic conditions. However, in some officers states of anxiety were observed, born of the fear lest they could not meet their responsibilities. At times, delirium sprang from resistance to measures necessitated by the "blackout" or on occasions when alarms were sounded. Tanon described under the name of "gas obsession" some forty cases in which persons appeared at aid stations alleging that they had breathed yperite or some other toxic gas. Similar conditions noted in soldiers were often due to the influence of alcohol. Laignel-Lavastine estimates that 90 per cent of the cases could be accounted for by alcohol.

Another aspect of the influence of the war is the simulation of incapacity among soldiers. This ranges from exaggerations of real symptoms to the creation of all kinds of morbid phenomena.

Hereditary Absence of Uterus

Pierre Delbet presented before the Academy of Medicine the family tree of a family in which, during successive generations, six girls were born without a uterus. All were normal, possessed secondary sex characteristics and were married. None had ever menstruated. Their vagina ended in a culde-sac, without any cervical vestige. The first of these women had lived more than a hundred years. She had had two sisters and one brother. One of the sisters had a daughter, who in turn had five daughters. The third and fifth of these were born without a uterus. The first and the fourth were normal. One of the daughters of the first of the sisters had a daughter without a uterus. The fourth of these sisters had two normal daughters. The second of these two daughters is the mother of five girls, two of whom have no uterus. Incidentally, the family tree of this family showed an extraordinary predominance of boys. Absence of the uterus, Delbet said, is a mutation of a recessive nature. However, in order that a recessive character may appear, the two sex chromosomes of the father and the mother must show it. One must accordingly assume that the female chromosomes may transmit recessive characters and that the male chromosomes, owing to a modification or some other reason, are favorable to this transmission. However, this is inconceivable and counter to the chromosome theory. Geneticists propose different explanations of analogous cases but these, according to Delbet, are based on assumptions.

Cancer of the Tongue

J. L. Roux-Berger and André Tailhefer, who made a study for the Curie Foundation, presented a report before the Journées cancerologiques de Liége on cancer of the mobile part of the tongue. Of 494 cases studied, only 2 per cent could not be traced; the remainder could be carefully studied for several years.

A threefold method of treatment was employed. A group of 185 patients were treated only with radiation; of these, 19 per cent recovered. A second group was treated surgically as well as radiologically. Of these, 22 per cent were found to be well in the fifth year; fourteen died of recurrence. Of thirty-six patients in whom an initial clinical adenopathy was encountered only 16 per cent were cured. Surgery alone was performed on forty-two patients and showed 45 per cent of cures after the fifth year. The high percentage of cures attained by the combined methods of treatment led to the adoption of this method at the Curie Foundation.

An analysis shows that it is difficult to make a diagnosis of the conditions of the glands and that carcinomas of the tongue the ganglions of which are affected quite often can be cured. Surgical treatment of carcinomatous recidivations was successful in 25 per cent of the cases. Local and regional anesthesia is generally employed. One must not fear to operate on both sides. In spite of improvements in technic, surgery of the carcinoma of the mobile part of the tongue lacks precision.

BUENOS AIRES

(From Our Regular Correspondent)

Feb. 28, 1940.

Psittacosis in Argentina

The first epidemic of psittacosis was diagnosed clinically by Barros of Cordoba in 1929. Since then distinct isolated outbreaks have been observed, in 1935 in Tandil, Mendoza and Bahia Blanca, and in 1939 in Buenos Aires. This last outbreak caused great publicity in the newspapers owing to the large number of cases and deaths. In 1938 Dr. Zuccarini was infected while studying the disease in the laboratory. In 1938 Australian parrots (Melopsittacosis undulatus) on sale were found infected, and in the majority of cases it has been proved that this species is the transmitter of the disease to man, and also the origin of human epidemics. In 1937 by government decree it became compulsory to report the disease and in 1938 the importation of parrots was forbidden, except those for zoological gardens or scientific institutes.

In the first cases the diagnoses were confirmed by Drs. Betson or Mayer by means of the complement fixation test. In more recent cases Sordelli and Zuccarini (*Rev. d. Inst. bact.*, Buenos Aires **9**:99, 1939) have been able to make the diagnosis by inoculating the blood of patients, preferably taken the third day of the disease, into the peritoneum of mice, and looking for Lewinthal corpuscles in the spleen, after about fifteen days. An interesting development is the diagnosis by inoculation of the sputum obtained on the seventh day, which is either filtered through a Chamberland filter or sulfapyridine is added, which prevents the death of mice by other micro-organisms but allows the evolution of the psittacosis. This is an easy diagnostic method.

Romaña's Sign for the Diagnosis of Trypanosomiasis Americana

In 1909 Chagas discovered Schizotrypanum cruzi in human blood in Brazil and described trypanosomiasis americana, which is now called Chagas' disease. Up to 1934, according to Reichenow, thirty-six cases had been found outside Brazil, twenty-one of these occurring in Argentina. In October 1935 Dr. Cecilio Romaña described a diagnostic sign, which consists of unilateral ophthalmia, characterized by three symptoms: palpebral edema, conjunctivitis and swelling of the regional lymph glands. This ophthalmia can be attributed to a local inoculation of the conjunctiva due to the excreta of Triatoma and has been reproduced experimentally in the monkey by Dr. Romaña.

This clinical sign has been the means of diagnosing a larger number of cases; thus 139 new cases were found in Argentina in ten months from August 1936 to June 1937. In 1938 the University Mission described 300 cases and by now has registered more than 500 human cases. The name Romaña's sign was given by Dr. Evandro Chagas (son of Carlos Chagas) and Emmanuel Dias in discussing a communication by Romaña in October 1935. According to Emmanuel Dias (*Brazil-med.* **53**:965 [Oct. 14] 1939) the discovery of Romaña's sign is the most important contribution made toward the study of Chagas' disease outside Brazil.

In two papers, S. Mazza (*Prensa méd. Argent.* **26**:1569 [Aug. 16] 1939, **27**:401 [Feb. 21] 1940) maintains that Carlos Chagas had already observed unilateral or bilateral palpebral edema, a sign that is by no means constant. He believes that the edema is not due to a local infection of the conjunctiva but to a localization of a general infection originating in some other part of the body. He affirms that Bayer's 7602 has a definite therapeutic activity in trypanosomiasis americana and that it can be considered as a specific remedy for this disease. Atabrine, on the other hand, which is advised by some authors, has no effect.

A National Central Hospital for Tuberculosis

The municipality of Buenos Aires has one special hospital, the Tornu (director Dr. A. Raimondi), and a large part of the Muniz Hospital for the care of tuberculous patients. The National Benevolent Society supports an important hospital in General Rodriguez, near Buenos Aires. The National Commission of Homes and Regional Hospitals has three large hospitals: Santa Maria and Domingo Funes (Cordoba) and another in La Rioja. The University of Cordoba has a chair of phthisiology directed by Prof. Raul Vaccarezza in a splendid building in the Muniz Hospital. There is also one institute for researches in phthisiology, directed by Professor Izzo in the Tornu Hospital. A great hospital is in construction in Buenos Aires which will depend on the Argentine League Against Tuberculosis. Besides these there are many dispensaries, homes for the children of consumptives and special wards in some hospitals.

One of the most serious difficulties of the antituberculosis campaign is the dependence on four or five official institutions which are independent of one another. To combine them, congress has passed a law which creates the National Commission for Tuberculosis.

Since there is no ministry of public health, and one cannot be established without an amendment of the constitution, the government has tried to combine two of the big official health organizations and has appointed Dr. J. J. Spangenberg president of the National Health Department and of the Commission of Homes and Hospitals. As an immediate consequence of this a national plan for the preventing of tuberculosis has been prepared and started with the opening, February 18, of a National Central Hospital for Tuberculosis in the buildings formerly occupied by the Military Hospital. The new hospital is directed by Dr. A. Cetrangolo, a well known specialist in tuberculosis.

ITALY

(From Our Regular Correspondent)

Feb. 15, 1940.

Congress of Internal Medicine

The forty-fifth congress of the Società italiana di medicina interna was held recently at Naples. Prof. Edoardo Maragliano, a senator and the president of the society, spoke on the modern trends of medical education in Italy. It is advisable to simplify research on biology in order to obtain more rapid results in interpretation of biologic phenomena and to include in medical studies only biologic facts which are already established on scientific grounds. It is advisable to give more importance to the teaching of certain medical subjects a thorough knowledge of which is indispensable in medicine and its branches. Roentgenology, physical therapy and phthisiology are at present classed as complementary selective subjects when they should be fundamental and compulsory subjects in medical curriculums.

The first official topic of the congress was lipoidosis. Professor D'Amato, with Rutishauer, classified lipoidoses into local and general. He found by clinical studies that the lesions of the nervous system and of the hypophysis are of primary importance in the development of the condition. It has been found also that perivascular fibroblasts, reticulo-endothelial cells and microglia take a part in the formation of foamlike cells. These studies point out the role of associated disturbances of the reticulo-endothelial system and the metabolism of lipoids in the pathogenesis of Christian's syndrome. The chemical analysis of the removed portion of a xanthoma showed a great amount of cholesterol in the tissues, especially esterified cholesterol. Prolonged glandular therapy in the course of a diet poor in fats failed.

Professor Bossa differentiated lipoidoses into phosphatic, cerebroside and cholesterol lipoidoses. He believes it advisable to

call phosphatic and cerebroside lipoidoses by the names of phosphatidosis and cerebrosidosis. Gaucher's disease, the only form of cerebrosidosis known, is characterized by a great accumulation of cerasine in some internal organs, especially the spleen. The lipoids accumulated in the tissues in cholesterosis are mixed with predominance of cholesterol and cholesterol esters. Experimental research has shown that disturbances of the metabolism of vitamins in the pathogenesis of lipoidosis is secondary.

The second official topic was the treatment of decompensated heart disease. The speakers were Professors Gamna, Giordano and Crovetti of the University of Turin. Professor Gamna said that the medical treatment of decompensated heart disease has two aims, the prevention and repair of decompensation. In preventing decompensation it is advisable to establish a proper way of living for the patient. The treatment of decompensation is carried out by placing the patient at complete rest and at the same time by withdrawing, as indicated, blood or fluids. Digitalis, or strophanthin intravenously, is indicated in insufficiency and dilatation and hypertrophy or auricular fibrillation.

Professor Crovetti discussed the treatment of cardiac decompensation. He does not believe in administering digitalis to persons with normal hearts who are to have a surgical operation or go through childbirth. Total thyroidectomy as a treatment for chronic cardiac decompensation is of theoretical rather than of practical value. The roentgen irradiation of the thyroids and other similar treatments are of no therapeutic value in decompensation. The next congress will take place in Rome.

National Congress of Surgery

The forty-sixth congress of the Società italiana di chirurgia was held at Naples simultaneously with the congress of internal medicine. The first official topic was abdominal trauma. Dr. Ceccarelli, professor of clinical surgery at the University of Padua, said that the most frequent causes of abdominal trauma during the last century were kicks by horses, whereas nowadays mechanical, industrial and automobile accidents are the most frequent. Traumatic abdominal lesions may be parietal, visceral or parietovisceral. Often they are associated with fractures of the ribs or the pelvis or rupture of the bladder. The development of gastroduodenal ulcer from external abdominal trauma is rare. Appendicitis may develop if several coadjuvant factors exist. In making a diagnosis it is important to differentiate the symptoms of alarm from those of certainty. If there are doubts about the extension and nature of the lesion and about the indications or contraindications of an immediate surgical operation it is advisable to watch the patient for results of immediate medical treatment. If the general and local conditions improve from medical treatment, the operation may not be necessary. An exploratory laparotomy is indicated if the symptoms are not modified by medical treatment several hours after trauma. Unjustified delay in operating may aggravate the prognosis by the hour. The mortality rate in rupture of the intestine varies between 80 and 100 per cent twenty-four hours after rupture. The preoperative treatment in abdominal trauma consists in improving the general condition of the patient by resorting to proper available means, especially blood transfusion.

The second official topic was surgery on the adrenals. Professor Durante of the University of Genoa said that the secretory functions of the adrenals can be reduced or arrested, without diminishing the adrenal parenchyma, by any of five different surgical operations: (1) neurotomy of the splanchnic nerves with consequent adrenal denervation, (2) lumbo-aortic, celiac or thoracic ganglionectomy, also with consequent denervation, (3) juxtalymphonodular denervation and ligation of either (4) the adrenal arterial peduncle or (5) the capsular vein. The secretory adrenal functions can be reduced with diminution of the cortical and medullary parenchyma by (1) partial or total unilateral adrenalectomy, (2) total unilateral or partial contralateral adrenalectomy or (3) partial bilateral adrenalectomy. They can be reduced with diminution of only the medullary parenchyma by medullectomy. Means for stimulating directly the adrenal secretory functions are unknown. Indirectly, they can be stimulated through decortication of the carotid bulb. He discussed the results he obtained from adrenalectomy in the treatment of syndromes of medullary or cortical hyperadrenalism, including endarteritis obliterans, as well as in essential epilepsy, diabetes, tumors and tuberculosis of the adrenals. Since 1935 he has resorted to medullectomy in the treatment of twenty-four patients suffering from syndromes of medullary hyperadrenalism.

The third topic was Banti's disease. Professors Cesa-Bianchi and Cellina of Milan spoke from the medical point of view. They found, by clinical observations and pathologic studies, that splenomegaly is the condition of primary importance in the pathogenesis of bantian syndromes. Disturbances of tonus of the spleen and of the intraparenchymal arterial pressure are influential in the development and establishment of splenomegaly. Processes of local congestion and of arterial blood engorgement are stimulated by the factors which induce splenomegaly with resultant disorders of hemopoiesis and the development of splenic anemia that Banti observed for the first time.

Professors Castiglioni and Pettinari spoke from the surgical point of view. Professor Castiglioni reviewed the results of surgery in all cases of bantian and similar syndromes reported after the 1926 congress. He reported in detail the results of surgical interventions in seventeen cases of bantian syndromes of his own practice. He concluded that the treatment of the condition is surgical whenever advisable. Splenectomy or ligation of the splenic artery is the indicated surgical procedure.

Professor Pettinari discussed the normal spleen as a structure of physiologic protection (by neutralizing or arresting improper substances). Any material which leaves the spleen passes to the liver. Both structures form a system with related lymphatic, nervous and circulatory routes. The proliferating substances of connective tissue of the spleen, which are produced during splenic autolysis, pass to the liver through the portal vein with consequent development of cirrhosis of the liver.

Professor Alessandri has operated on the spleen in 109 cases. Splenectomy was performed in seventy-nine cases and ligation of the splenic artery in seventeen cases. He pointed out the importance of collaboration between physicians and surgeons as carried on in the United States, with special reference to surgery of the spleen in the spleen clinic at Columbia University. Professor Puccinelli reported results of splenectomy in sixty-four cases. In twenty cases the operation was resorted to for the treatment of bantian syndromes. The rate of mortality in his cases was 20 per cent.

The next congress will be held at Rome. The following official topics will be discussed: (1) pyogenic general infections, (2) tuberculosis of genital apparatus in man and (3) treatment of open fractures of lower extremities, especially fractures with lesions of firearms.

Marriages

FRANK WALTER QUATTLEBAUM, Pavo, Ga., to DR. JANE ELIZABETH HODGSON of Crookston, Minn, February 22.

HIRAM PHELPS SALTER, Bronxville, N. Y., to Miss Elizabeth Guion of New Rochelle, January 16.

EDGAR WILLIS LACY JR., Pulaski, Va., to Miss Alma Covell Pancake of Romney, W. Va., January 20.

GIBSON LEWIS SIKES, Salemburg, N. C., to Miss Margaret Lee MacLeod of Cameron, Dec. 22, 1939.

FRANK WILSON JR., Raleigh, N. C., to Miss Alice Rogers Barbour of Clayton, February 2.

DAVID REID WEIR, Cleveland, to Miss Arria Morison of Boston, March 8.

Deaths

Ferdinand Claiborne Walsh ● Hunt, Texas; University of Virginia Department of Medicine, Charlottesville, 1899; past president of the Bexar County Medical Society; member of the American Urological Association; demonstrator in genito-urinary diseases at the Georgetown University School of Medicine, Washington, D. C., from 1903 until 1906, and during the same period was assistant in the department of surgery, Georgetown University Hospital, Washington, D. C.; fellow of the American College of Surgeons; on the staff of the Santa Rosa Hospital, San Antonio, and the Robert B. Green Memorial Hospital, San Antonio; aged 62; died, February 15.

Walter Whitney Boardman ● San Francisco; Cooper Medical College, San Francisco, 1909; instructor of medicine and director of actinography, Stanford University School of Medicine, in 1912, assistant professor of medicine in 1914, associate professor from 1915 to 1918, later associate clinical professor and clinical professor of medicine; fellow of the American College of Physicians; served during the World War; aged 56; died, February 11, in the Stanford Hospital of carcinoma of the rectum.

Julius Frischer ● Beverly Hills, Calif.; University Medical College of Kansas City, Mo., 1905; member of the Missouri State Medical Association and the American Urological Association; formerly urologist to the Grace Hospital, General Hospital and the Menorah Hospital, Kansas City, Mo.; served during the World War; aged 53; died, February 21, of coronary thrombosis.

Perle Clifton Irwin ● Seattle; State University of Iowa College of Medicine, Iowa City, 1904; fellow of the American College of Surgeons; on the staffs of St. Luke's Hospital and the Providence Hospital; veteran of the Spanish-American War; fire department physician; aged 63; died, February 12, following an operation for carcinoma of the colon.

Jesse D. Edwards, Siler City, N. C.; Louisville (Ky.) Medical College, 1887; member of the Medical Society of the State of North Carolina; past president of the Chatham County Medical Society; formerly mayor and member of the state legislature; aged 78; died, February 18, of coronary thrombosis, myocarditis and hypostatic pneumonia.

Faneuil Suydam Weisse ● Winter Park, Fla.; Columbia University College of Physicians and Surgeons, New York, 1900; member of the Medical Society of the State of New York; formerly medical director of the Mutual Life Insurance Company of New York; aged 64; died, February 24, of chronic myocarditis and diabetes mellitus.

Glenn W. Stockwell ● Detroit; Detroit College of Medicine, 1903; formerly assistant clinical professor of surgery at his alma mater; fellow of the American College of Surgeons; member, adjunct staff, Harper Hospital; served as surgeon for the city fire department; aged 60; died, February 19, of carcinoma of the sigmoid.

Malvin M. Hauge, Clarkfield, Minn.; Minneapolis College of Physicians and Surgeons, 1907; owner and medical director of the Clarkfield Community Hospital; member of the Minnesota State Medical Association; fellow of the American College of Surgeons; aged 63; died, January 31, of myasthenia gravis and diabetes mellitus.

Ralph Willis Nutter, New York; University of Vermont College of Medicine, Burlington, 1916; member of the Medical Society of the State of New York; on the staffs of the New York Nursery and Child's Hospital, Manhattan Maternity Hospital and the French Hospital; aged 47; died, February 26, of heart disease.

John Colin Vaughan, New York; Columbia University College of Physicians and Surgeons, New York, 1907; formerly instructor in anatomy and surgery at his alma mater; fellow of the American College of Surgeons; at one time attending surgeon to the Grant County Hospital, Marion, Ind.; aged 64; died, January 12.

Charles Overton Burruss, Sharon, S. C.; University of Maryland School of Medicine, Baltimore, 1906; member of the South Carolina Medical Association; aged 58; died, February 27, in the Mercy Hospital, Charlotte, N. C., of essential hypertension, arteriosclerosis and cerebral hemorrhage.

Arthur Munson Macnamee, Batavia, Ohio; Georgetown University School of Medicine, Washington, D. C., 1898; member of the Medical Society of the District of Columbia; veteran of the Spanish-American and World wars; aged 65; died, February 7, of rheumatic endocarditis.

Benjamin Henry Bascum Hubbard, White Stone, Va.; University of Maryland School of Medicine, Baltimore, 1895; member of the Medical Society of Virginia; for many years member of the U. S. Public Health Service; formerly bank president; aged 65; died, January 7.

Frederic Storchheim, Wauwatosa, Wis.; Rush Medical College, Chicago, 1929; member of the State Medical Society of Wisconsin and the American Psychiatric Association; on the staff of the Milwaukee Asylum for Chronic Insane; aged 48; hanged himself, Dec. 8, 1939.

Beverly Freeland Moseley, Hattiesburg, Miss.; Medical College of Alabama, Mobile, 1900; member of the Mississippi State Medical Association; aged 68; died, February 14, at the Methodist Hospital of burns received when his clothes caught fire from a bathroom heater.

Emmett A. Pickens, Bentonville, Ark.; University of Arkansas School of Medicine, Little Rock, 1909; member of the Arkansas Medical Society; past president of the Benton County Medical Society; formerly county health officer; aged 66; died, January 29, of heart disease.

Abner G. Greenstreet, Seattle; Columbian University Medical Department, Washington, D. C., 1900; member of the Washington State Medical Association; past president of the Puget Sound Academy of Opththalmology and Otolaryngology; aged 76; died, January 1.

George Byron Whitmore ● Surgeon Lieut. Commander, U. S. Navy, retired, Coral Gables, Fla.; Jefferson Medical College of Philadelphia, 1903; entered the navy in 1908 and retired in 1922 for incapacity resulting from an incident of service; aged 59; died, January 20.

James Robert Rogers, Brownington, Mo.; University Medical College of Kansas City, 1909; member of the Missouri State Medical Association; aged 55; died, Dec. 13, 1939, in the Trinity Lutheran Hospital, Kansas City, of perforated gastric ulcer and peritonitis.

Omer Oral Gain, Dublin, Texas; St. Louis College of Physicians and Surgeons, 1910; member of the State Medical Association of Texas; served during the World War; member of the school board; aged 62; was killed, February 27, in an automobile accident.

Lemuel Jones Godbey, Lexington, Ky.; Kentucky School of Medicine, Louisville, 1898; served during the World War; member of the American Psychiatric Association; aged 69; on the staff of the Veterans Administration Facility, where he died, January 10.

Frank E. Kauffman ● Clearwater, Fla.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1897; an Affiliate Fellow of the American Medical Association; aged 71; on the staff of the Morton F. Plant Hospital, where he died, January 29.

Frank M. Knight, Alliance, Neb.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1882; aged 82; died, January 12, in the Methodist Hospital, Omaha, of gangrene of the right leg and thigh, thrombosis and bronchopneumonia.

Clarence Ambrose McGuire, Dubuque, Iowa; St. Louis College of Physicians and Surgeons, 1909; member of the Iowa State Medical Society; served during the World War; aged 51; died, February 3, in the Mercy Hospital of ruptured aortic aneurysm.

Arthur Wellesley Peshay ● Piedmont, Calif.; University of California Medical Department, San Francisco, 1904; aged 63; died, January 13, in the Providence Hospital, Oakland, of lobar pneumonia, chronic endocarditis and diabetes mellitus.

James Thomas Flanagan, Brooklyn; Johns Hopkins University School of Medicine, Baltimore, 1908; member of the Medical Society of the State of New York; served during the World War; aged 57; was found dead, February 28.

Campbell Davidson, Qualicum Beach, B. C.; McGill University Faculty of Medicine, Montreal, Que., 1898; for many years medical officer of health and medical school inspector; aged 62; died, February 16, of coronary disease.

Ottis Like, Monroe City, Ind.; Washington University School of Medicine, St. Louis, 1911; served during the World War; aged 58; died, February 21, at the Wilgus Sanitarium, Rockford, Ill., of cardiovascular renal disease.

Joseph Stephen Terrando ● La Salle, Ill.; Regia Università degli Studi di Parma. Facoltà di Medicina e Chirurgia, Italy, 1903; aged 67; on the staff of St. Mary's Hospital, where he died, February 20, of coronary thrombosis.

James Milton Miller, Decatur, Ind.; Medical College of Ohio, Cincinnati, 1886; member of the Indiana State Medical Association; formerly city health officer and county physician; aged 79; died, February 16, of myocarditis.

Henry Krogstad, Washington, D. C.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1888; New York Homeopathic Medical College and Hospital, 1889; aged 81; died, January 23, at Richmond, Va.

Louis George Pinault, Campbellton, N. B., Canada; Laval University Faculty of Medicine, Quebec, 1898; fellow of the American College of Surgeons; on the staff of the Hotel Dieu Hospital; aged 66; died, January 8.

David Harry R. Patton ● Chicago; Baltimore Medical College, 1896; on the staffs of the Illinois Masonic Hospital and the Woodlawn Hospital; aged 72; died, February 28, of myocarditis and coronary sclerosis.

Leon J. Tunitzky, Philadelphia; Temple University School of Medicine, Philadelphia, 1910; on the staffs of the Northern Liberties Hospital, Woman's Hospital and the Homewood School; aged 60; died, January 9.

William Thomas Tanner, Oneida, N. Y.; University of Buffalo School of Medicine, 1884; formerly county coroner; veteran of the Spanish-American War; aged 76; died, Dec. 4, 1939, of cerebral hemorrhage.

John Robert Sigler, Corydon, Ky.; University of Louisville Medical Department, 1877; aged 88; died, February 10, in the Welborn-Walker Hospital, Evansville, Ind., of hypertrophy of the prostate and uremia.

Thomas Wallbank Preston, Balfour, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; aged 83; died, January 4.

John L. Bostwick, Hulett, Wyo.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; aged 66; died, February 18, in the McHenry Hospital, Gillette, of cirrhosis of the liver.

William James Innes, Atlanta, Ga.; University College of Medicine, Richmond, 1901; past president and secretary of the Lee County, Va., Medical Society; aged 75; died, February 10, at Marion, Va.

William S. Applegate, Parsippany, N. J.; Jefferson Medical College of Philadelphia, 1883; member of the Medical Society of the State of New York; aged 87; died, February 6, of arteriosclerosis.

Arne Zetlitz, Long Beach, Calif.; Toledo Medical College, 1891; formerly a practitioner in Sioux Falls, S. D.; aged 75; died, February 5, of cerebral hemorrhage, arteriosclerosis and paralysis agitans.

Marova Dickerman Brown, De Kalb, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1898; member of the Illinois State Medical Society; aged 77; was found dead, February 8.

Hamilton H. Tyndale, Salt Lake City; Columbia University College of Physicians and Surgeons, New York, 1933; intern at St. Mark's Hospital; aged 34; was found dead, Dec. 20, 1939.

Paul Joseph Moloney, Ottawa, Ont., Canada; Trinity Medical College, Toronto, 1893; associate professor of hygiene at the University of Toronto Faculty of Medicine; died, Nov. 12, 1939.

Frank Osgood Bumgarner ● Pittsburgh; Medico-Chirurgical College of Philadelphia, 1904; aged 61; died, January 17, in the Mayview Hospital of arteriosclerotic heart disease.

Allan Graham Hurdman, Ottawa, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1901; L.R.C.S., and L.R.C.P., Edinburgh, Scotland, 1903; aged 62; died, Dec. 11, 1939.

Ira Dietrich Heckman ● Coral Gables, Fla.; Jefferson Medical College of Philadelphia, 1920; member of the Medical Society of the State of Pennsylvania; aged 45; died, January 27.

Albert Rit Conrad, Caruthersville, Mo.; University of Tennessee Medical Department, Nashville, 1889; member of the Missouri State Medical Association; aged 76; died, February 2.

Robert H. Lasater ● Lawson, Texas; Memphis (Tenn.) Hospital Medical College, 1895; aged 86; died, February 19, in Dallas of benign hypertrophy of the prostate and arteriosclerosis.

Minda Agnes McLintock, Atchison, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1888; member of the Kansas Medical Society; aged 83; was found dead, January 5.

Edward C. Love, Calistoga, Calif.; California Medical College, San Francisco, 1895; aged 68; died, January 18, in the Samuel Merritt Hospital, Oakland, of coronary thrombosis.

John F. Freeman, Atlanta, Ga.; Chattanooga (Tenn.) Medical College, 1892; member of the Medical Association of Georgia; aged 71; died, February 28, of bronchopneumonia.

Joseph Kittredge, North Andover, Mass.; Harvard Medical School, Boston, 1880; member of the Massachusetts Medical Society; aged 81; died, January 31, of cerebral thrombosis.

Ernest Folger Pope, Boston; Colorado School of Medicine, Boulder, 1902; member of the Massachusetts Medical Society; served during the World War; aged 65; died, January 26.

Harold Blaine Scovern ● Carrollton, Mo.; Jefferson Medical College of Philadelphia, 1915; member of the board of education; aged 48; died, February 14, of heart disease.

Victor Geoffrion, L'Assomption, Que., Canada; School of Medicine and Surgery of Montreal, 1893; registrar of L'Assomption; at one time mayor; died, January 10.

Leonard John Nilles ● Rollingstone, Minn.; University of Minnesota Medical School, Minneapolis, 1936; aged 37; died, February 2, at Winona of rheumatic heart disease.

George Charles Kondorf, Michigan City, Ind.; Long Island College Hospital, Brooklyn, 1907; aged 68; died, February 21, in St. Anthony Hospital of cerebral hemorrhage.

Daniel Raymond McNally, Providence, R. I.; Boston University School of Medicine, 1906; member of the New England Roentgen Ray Society; aged 56; died, January 8.

Henry Clay Scarlett, Greensboro, N. C.; Meharry Medical College, Nashville, Tenn., 1907; aged 54; died, January 25, of hypertension and cardiovascular renal disease.

George Wilson Staples, St. Claude, Man., Canada; Manitoba Medical College, Winnipeg, 1896; aged 78; died, February 23, in Carman of carcinoma of the stomach.

Nereus Cook Kemp, Ossining, N. Y.; Hahnemann Medical College and Hospital, Chicago, 1886; aged 78; died, January 18, of coronary thrombosis and arteriosclerosis.

Sara Isabell Barnard, Steelville, Mo.; Homeopathic Medical College of Missouri, St. Louis, 1899; aged 72; died, February 1, in Portage Des Sioux of carcinoma.

James Ward Slattery ● Mountain View, Calif.; College of Medical Evangelists, Los Angeles, 1933; aged 42; died, January 19, of chronic valvular heart disease.

Elmer E. Fowler, Oak Hill, Ohio.; Starling Medical College, Columbus, 1897; aged 76; died, February 4, in the Athens (Ohio) State Hospital, of arteriosclerosis.

Charles A. Poindexter, Middleport, Ohio; Ohio Medical University, Columbus, 1895; member of the Ohio State Medical Association; aged 68; died, Dec. 11, 1939.

Charles M. E. Watson ● Lansing, Mich.; Hahnemann Medical College and Hospital, Chicago, 1885; aged 80; died, February 16, of acute cardiac dilatation.

Walter Mendelson, Philadelphia; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1879; aged 82; died, January 18.

Barlow Lloyd Price, Palestine, Ill.; Chicago College of Medicine and Surgery, 1916; member of the Illinois State Medical Society; aged 50; died, January 10.

Richard Deidrich Schmidt, Boston; Tufts College Medical School, Boston, 1904; member of the Massachusetts Medical Society; aged 68; died, Dec. 18, 1939.

Joseph Gerald Hayes, Ridgway, Pa.; Georgetown University School of Medicine, Washington, D. C., 1929; county coroner; aged 33; died, Dec. 16, 1939.

Theophile D. Boulanger, Montreal, Que., Canada; M.B., Laval University Faculty of Medicine, Quebec, 1896, and M.D., in 1898; aged 63; died, Dec. 29, 1939.

Garner Shepard Warren, Decherd, Tenn.; Vanderbilt University School of Medicine, Nashville, 1894; aged 76; died, February 9, of cerebral hemorrhage.

Charles Leroy Lamont, West Frankfort, Ill.; National University of Arts and Sciences Medical Department, St. Louis, 1912; aged 59; died, Dec. 16, 1939.

Richard F. Bigger, Pontiac, Mich.; Medical College of Indiana, Indianapolis, 1887; aged 79; died, January 1, in Carrollton, Ill., of coronary thrombosis.

Charles Francis Crutchlow, Westmount, Que., Canada; University of Bishop College Faculty of Medicine, Montreal, 1904; aged 66; died, Dec. 21, 1939.

Joseph Lane Finley, Grasonville, Md.; University of Maryland School of Medicine, Baltimore, 1884; aged 79; died, February 18, of arteriosclerosis.

Charles Augustus Mitchell, New York; New York Homeopathic Medical College and Hospital, New York, 1896; aged 70; died, Dec. 14, 1939.

Alfred William Pleasants Sr., Lexington, Va.; Leonard Medical School, Raleigh, 1906; aged 62; died, January 31, of carcinoma of the prostate.

George Blackford, Eldorado, Ohio; Pulte Medical College, Cincinnati, 1904; formerly member of the county board of health; aged 58; died, January 28.

James Lee Sutherland, Los Angeles; Rush Medical College, Chicago, 1882; aged 85; died, Dec. 21, 1939, of cerebral thrombosis and arteriosclerosis.

Eli Burton Mayfield, St. Louis; St. Louis College of Physicians and Surgeons, 1886; aged 77; died, February 19, of cerebral hemorrhage.

Adam J. Dauer, Toledo, Ohio; Rush Medical College, Chicago, 1903; aged 64; died, February 24, in the Flower Hospital of coronary thrombosis.

Charles Sandford Neer ● Baltimore; College of Physicians and Surgeons, Baltimore, 1893; aged 69; died, January 8, of carcinoma of the liver.

Alvin F. Harrison ● Topeka, Kan.; University Medical College of Kansas City, Mo., 1895; aged 73; died, February 24, of coronary occlusion.

Alfred D. Leonard, Middletown, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1878; aged 86; died, January 22.

Patrick C. Donovan, San Jose, Calif.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1879; aged 89; died, Dec. 15, 1939.

Evangeline Brigham Uth, Oakland, Calif.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1886; aged 77; died, Dec. 3, 1939.

Perley Taylor Kierstead, Fredericton, N. B., Canada; Dartmouth Medical School, Hanover, N. H., 1884; aged 80, died, January 15.

John Clark Paris, Kenton, Tenn.; Hospital College of Medicine, Louisville, Ky., 1879; Confederate veteran; aged 88; died, January 31.

John Charles McKinney, Athens, Ga.; University of the South Medical Department, Sewanee, Tenn., 1898; aged 70; died, January 31.

Benjamin H. Dougan, Harvey Station, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1905; died, January 1.

Charles Albert Drummond, Ashcroft, B. C., Canada; Trinity Medical College, Toronto, Ont., 1895; aged 72; died in December 1939.

Andrew Jackson Fitzgerrell, North Hollywood, Calif.; Missouri Medical College, St. Louis, 1881; aged 83; died, Dec. 17, 1939.

Robert Lee Cram, Park City, Mont.; Colorado School of Medicine, Boulder, 1906; aged 61; died, January 16, of cerebral hemorrhage.

George Hall Bowles, Plymouth, N. H.; Harvard Medical School, Boston, 1893; formerly bank president; aged 79; died, January 19.

John Benjamin Stallwood, Beamsville, Ont., Canada; University of Toronto Faculty of Medicine, 1904; aged 63; died, January 11.

Arthur W. Furness, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, Que., 1911; aged 59; died, January 14.

Dudley H. Pearson, Clay Brook, Tenn.; University of Tennessee Medical Department, Nashville, 1890; aged 71; died, January 17.

Robert Johnston, Tamworth, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1933; aged 36; died, January 27.

Joseph Wright Miller, Avinger, Texas; Baylor University College of Medicine, Dallas, 1931; aged 36; was burned to death, January 25.

Daniel W. Shelly, Ambler, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1882; aged 79; died, January 16.

Charles Wilburn Miller, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1905; aged 67; died, January 6.

Robert Phinous Frazier, Neptune, Tenn.; University of Nashville (Tenn.) Medical Department, 1908; aged 60; died, January 9.

Ronald Geddes Calder, St. Catharines, Ont., Canada; University of Toronto Faculty of Medicine, 1930; aged 37; died, January 6.

Thomas Brown MacDonald, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1898; aged 71; died, January 5.

George Milne Brodie, Woodstock, Ont., Canada; Victoria University Medical Department, Coburg, 1886; aged 83; died, January 6.

Oscar S. Seidel, Cincinnati; Medical College of Ohio, Cincinnati, 1898; aged 64; died, February 7, of chronic interstitial nephritis.

Arthur Julian Wilson, Plattsmouth, Neb.; John A. Creighton Medical College, Omaha, 1895; aged 79; died, Nov. 10, 1939.

William Walter Scott, New York; University of the City of New York Medical Department, 1895; aged 68; died, Dec. 19, 1939.

Edward I. Hall, Jennings, La.; Rush Medical College, Chicago, 1881; at one time postmaster; aged 89; died, Dec. 3, 1939.

Joseph Aloysius Francis Nall, Philadelphia; Jefferson Medical College of Philadelphia, 1920; aged 49; died, Dec. 5, 1939.

Emil Albert Buchholz, Mount Carmel, Ill.; Kentucky School of Medicine, Louisville, 1899; aged 76; died, Dec. 6, 1939.

George Albert Morrill, Groton, Mass. (licensed in Massachusetts by years of practice); aged 70; died, Dec. 22, 1939.

William Richard Coles, Regina, Sask., Canada; Trinity Medical College, Toronto, Ont., 1901; aged 67; died, Dec. 16, 1939.

John Raper, Bashaw, Alta., Canada; University of Manitoba Faculty of Medicine, Winnipeg, 1924; aged 58; died, Dec. 29, 1939.

John T. Jessup, Elwood, Ind.; Indiana Medical College, Indianapolis, 1873; aged 91; died, February 10, of heart disease.

Archibald D. Graham, Bothwell, Ont., Canada; Trinity Medical College, Toronto, 1887; aged 79; died, Dec. 9, 1939.

Michael Charles Burke, High River, Alta., Canada; Manitoba Medical College, Winnipeg, 1915; aged 51; died, January 1.

Jack Hood Reid, Wharton, Texas; University of Texas School of Medicine, Galveston, 1929; aged 35; died in January.

Nicolas Collisi, Alhambra, Calif.; Detroit College of Medicine, 1894; aged 85; died, January 25, of coronary sclerosis.

Willis Washington Hammons, Houston, Texas; Medical College of Alabama, Mobile, 1891; aged 84; died, January 10.

Charles Sumner Digga, Los Angeles; Meharry Medical College, Nashville, Tenn., 1901; aged 66; died, Dec. 6, 1939.

Alfred L. Deacon, Los Angeles; Kentucky School of Medicine, Louisville, 1885; aged 80; died, Dec. 15, 1939.

James Fleming, Balboa Island, Calif.; Manitoba Medical College, Winnipeg, 1899; aged 71; died, Dec. 30, 1939.

Thomas Creigh Park, Philadelphia; Jefferson Medical College of Philadelphia, 1905; aged 63; died, January 12.

Adrian Benton Perkey, Altadena, Calif.; Rush Medical College, Chicago, 1899; aged 65; died, Dec. 27, 1939.

William Henry Johnson, Turlock, Calif.; Baltimore Medical College, 1904; aged 67; died, Dec. 28, 1939.

Fletcher Lothair Tatom, Lake Worth, Fla.; Atlanta Medical College, 1895; aged 66; died, February 26.

Hedley Vicars Kent, Truro, N. S., Canada; Halifax Medical College, 1890; aged 80; died, January 31.

Samuel Haley, Joy, Ill.; Northwestern University Medical School, Chicago, 1896; aged 77; died, February 19.

Jacob Levy, Philadelphia; Jefferson Medical College of Philadelphia, 1908; aged 56; died, February 2.

Robert Lee Douglas, Lutts, Tenn. (licensed in Tennessee in 1912); aged 67; died, Dec. 11, 1939.

Correspondence

DELAYED APPEARANCE OF HEART DISEASE AFTER RHEUMATIC FEVER

To the Editor:—An article of interest and practical importance by Drs. Edward F. Bland and T. Duckett Jones "The Delayed Appearance of Heart Disease After Rheumatic Fever," appeared in THE JOURNAL, Oct. 7, 1939.

Sir Arthur Newsholme repeatedly expressed the opinion that rheumatic fever does not exist without endocarditis and further stated, as is well known, that clinical recognition of the lesion might be delayed for some time. If my memory serves me, I believe he suggested the name "endocarditis rheumatica" as the most descriptive term for the infection.

Many years ago Sansum, a well known English clinician of his period, called attention to reduplication of the first sound as a precursor of mitral stenosis, a sound which might precede the clinical appreciation of a stenotic lesion by many months.

Approximately thirty years ago I saw a child who had, as is so common, mild evanescent evidences of arthritis, promptly followed by a mitral lesion. He was kept at rest in bed for six months and permitted carefully graded exercise during the following six months. The murmur totally disappeared and there was no subsequent demonstrable evidence of increase in the cardiac area. However, his general health was never good, and though he never manifested another attack of rheumatic fever he remained undernourished and underdeveloped throughout the years.

After the lapse of thirty years, an infection of the upper respiratory tract developed and later a diffuse bronchitis without joint manifestations. Promptly following this infection, he manifested a frank mitral stenosis which has remained in evidence, but which doubtless had existed throughout the years, though it had been only suspected and never proved until the recent infection brought it to light. It is likely, however, that it was a dominant factor militating against his general health and development.

W. E. ROBERTSON, M.D., Philadelphia.

PRESENT STATUS OF THERAPY WITH CHORIONIC GONADOTROPIN

To the Editor:—In the report of the Council on Pharmacy and Chemistry dealing with "The Present Status of Therapy with Chorionic Gonadotropin," which appeared in THE JOURNAL, February 10, page 487, the statement was made that "Rubinstein claims that the sperm counts increased following such therapy. His results are statistically unconvincing." Since to the uncritical reader such a statement is interpreted as being synonymous with a misrepresentation of facts, may I take this opportunity to make several additional observations? In my original article (*Endocrinology* **23**:75 [July] 1938), which reported studies on six healthy adults, no attempt at statistical analysis was made because it was felt that spermatozoal counts differed so much between the different patients and was so inconstant even in the same patient for similar interval periods that a grouped comparison would hardly be in order. From the data obtained, however, it was concluded that after varying periods of treatment all subjects responded with increased spermatozoal output. This statement was based on the fact that in each patient, after from four to six weeks of treatment, a maximum count was obtained which was greater than the maximum accepted for the control period of observation.

Since this criticism was made, the results have been tested statistically by comparing the maximum sperm counts obtained before, during and after treatment in all cases. It was found that the mean maximum counts in millions for these three periods were 346, 482 and 379 respectively, thus showing an increase in millions of 136 and 33 for the treatment and after-treatment periods respectively over the pretreatment maximum. Testing these differences by the statistical method of Fisher for small series, it was found that the treatment period increase of 136 gave a t of 3.27, while the post-treatment difference of 33 gave a t of 0.94. When these values of t are compared with those in table IV of Fisher (at 10 degrees of freedom) they are found to give values of P which are less than 0.01 and greater than 0.3 respectively. From this one must conclude that the maximum counts observed during the treatment period were probably significantly greater than the maximum counts observed before treatment. By the same criteria, the maximum counts observed in the post-treatment period were not significantly greater than those noted before treatment began. Statistical analysis therefore corroborates the claim that spermatozoal output was stimulated in these normal men as the result of treatment. This, however, does not imply that the hormone can be used to treat azoospermia or oligospermia. From the study as originally published, it just means that the hormone in the dosage used stimulated spermatozoal output in the normal male. It is somewhat confusing that the reviewer was willing to disregard the reports of Brosius and Schaefer, Heckel and Rubinstein regarding the increased spermatozoal output and yet quoted as final the report of McCahey, who in his paper (*Pennsylvania M. J.* **41**:359 [Feb.] 1938) gave details regarding only two cases. At the end of his paper McCahey makes the note "Since this paper was written, I have had a successful result in a case of necrospermia. The patient was age 35, and the basal metabolic rate was minus 2. Two cc. of antuitrin-S were injected biweekly and at the end of fifteen weeks the specimens contained numerous active spermatozoa." Reviews such as these almost force one to the conclusion that the reviewer is unduly swayed by prejudice.

It appears that many discrepancies in reports dealing with the effects of endocrine products arise from the differences in dosage employed by the different investigators. Thus, the same hormone (e. g. testosterone propionate) used under similar laboratory or clinical conditions may show stimulating or depressing effects depending on the dosage used. It is a common error for clinicians who observe mild stimulating effects with a certain dosage of hormone to increase the amount administered rapidly in order to magnify the desired effect. Much to their chagrin they are disappointed and, forgetting the initial gratifying result obtained with the smaller dose, conclude that the hormone was useless.

In the attempt to orient ourselves properly to the rapidly moving events in the field of endocrinology, not only is it necessary that clinicians and investigators observe critically and report without undue claims their respective observations, but it is even more important that reviewers analyze material carefully so that medicine in general may profit to the utmost from the labors of all conscientious researchers.

H. S. RUBINSTEIN, M.D., Baltimore.

COMMENT.—The following is a reprint of the paragraph under discussion:

SPERMATOGENESIS

Several investigators have reported the use of chorionic gonadotropin in sterility. Their studies are rather incomplete. Brosius and Schaefer have reported the induction of spermatogenesis with such therapy in a case of azoospermia. Heckel has treated eight sterile males with this substance, after which the wives of two became pregnant. Rubinstein claims that the sperm counts increased following such therapy. His results are statistically unconvincing. On the other hand, McCahey was unable to demonstrate any increase in the sperm count after injection of chorionic gonadotropin. Many other urologists have been disappointed in its use in sterility. The physiologic response of this substance in experimental animals would not lead one to anticipate much of an effect on spermatogenesis, since it is well known that this substance influences chiefly the interstitial cells and has little if any effect on the germinative epithelium. It is therefore apparent that deficient sperm formation is a doubtful indication for such therapy on both clinical and experimental evidence.

It does not appear that this paragraph portrays any prejudice on the part of the reviewer, nor has he disregarded the work

of Brosius and Schaefer and of Heckel, nor does he stress the work of McCahey, whose results are not in agreement with those of the aforementioned workers.

The object of the original report was, of course, to evaluate the results in the literature in an effort to prevent the widespread use of endocrine preparations for indications which had not been established on a sound basis or as a result of adequate clinical data. The reviewer does not believe that the literature contains sufficient evidence to recommend the use of chorionic gonadotropin for the induction of spermatogenesis, and this belief is apparently shared by Dr. Rubinstein himself.—Ed.

"EFFECT OF SULFONAMIDE DERIVATIVES ON AIRPLANE PILOTS"

To the Editor:—In connection with the article "The Effect of Sulfonamide Derivatives on Airplane Pilots" appearing on page 1237 of the Sept. 23, 1939, issue of The Journal, the Medical Section of the Civil Aeronautics Authority has the record of an airplane accident regarded by it as being due to the effects of sulfanilamide ingested by the pilot. It is believed that this may have been the contributing factor in other accidents and that aircraft pilots are not sufficiently familiar with the possible effects of this and similar drugs.

Presumably, physicians prescribing sulfanilamide and related drugs are aware of such effects and caution patients whom they know to be aircraft pilots regarding the danger of piloting while using these drugs, yet many persons flying only for pleasure may seek medical advice without informing the physician of their piloting activity. Also these drugs are used for self medication without being prescribed by a physician.

In the belief that wider publicity regarding the effects of sulfanilamide on the nervous system will tend to prevent accidents attributable to this cause, it is requested that publicity be given this subject in The Journal, advising physicians of the importance of cautioning their patients against piloting aircraft or engaging in similar activities during or a few days after taking sulfanilamide, sulfapyridine or similar drugs.

Eldridge Adams, M.D., Washington, D. C.
Chief, Medical Section, Civil Aeronautics Authority.

THE USE OF SULFANILAMIDE AS PROPHYLAXIS FOR SCARLET FEVER

To the Editor:—A recent local epidemic of scarlet fever followed by a number of endemic cases has given an opportunity for a study of the use of sulfanilamide as prophylaxis to children exposed to scarlet fever. At first it was used only in cases in which the cost of the scarlet fever antitoxin was prohibitive or it was feared that some reaction might attend the use of the antitoxin. Later, when it was seen that the use was successful in the prevention of the disease, it was used in all cases of exposure. To date in only one person of 116 exposed has scarlet fever developed after the use of sulfanilamide, and in this one exception the person had been exposed five days previously and the fever developed the day following the start of the drug.

Perhaps the most spectacular instances and the two that started the use of the drug in this capacity occurred in two families seen on the same day, living in separate homes but almost in the same yard. Both families were on relief, both were living in two or three room houses and both had large families of young children. Here the cost of antitoxin was prohibitive and, as both families certainly needed prophylaxis of some nature, in desperation sulfanilamide was used. The course of disease in the two families is given in the following report:

Family 1.—Albert B., aged 13 years, seen in September 1938, presented a typical textbook picture of scarlet fever, with strawberry tongue, sore throat, pinpoint rash over the body and a history of fever for three days, headache and vomiting. There were three other children aged 9, 11 and 15, all living in the same house of three rooms, in almost constant contact. The three exposed children were given 5 grains (0.3 Gm.) three times a day for five days. None of them contracted scarlet fever, but fourteen months later, within a day apart, all three contracted the disease. At this later date an epidemic was present but the source of contact was not determined.

Family 2.—In September 1938 on the same day on which Albert B. was seen Roy H. aged 12 years was seen and a tentative diagnosis of scarlet fever was made. The symptoms were not definite, but the boy had a fever of 101 F. and a sore throat but only a slight blush over the body. There were eight other children in this family ranging in age from 6 to 17 years. Sulfanilamide was prescribed but owing to the mother's belief that the child did not have scarlet fever she did not give the sulfanilamide. Within fourteen days, all except the 17 year old girl had scarlet fever.

The tabulation shows the results of sulfanilamide prophylaxis in a number of the cases of exposure. The dosage used was 5 grains three times a day.

Patient	Exposed Child	Age, Years	Incubation Days	Result
Berniece	Everitt	10	2	No fever
Bernard	Alec	7	4	No fever
	Paul	10	4	No fever
	Ruth	12	4	No fever
	Melvin	21	4	No fever
	Albert	18	4	No fever
Fred	John	6	5	Slight rash and fever next day; very mild

The cases included in the tabulation are typical of the many observed during the past two years and in addition to these a complete record of ten patients with scarlet fever exposing in their families twenty-six children of various ages and with doses of sulfanilamide from 2 grains (0.13 Gm.) in 3 and 4 year old children to 5 grains every three hours in adults, no cases of scarlet fever have developed. From this it seems that for an average weight of 75 pounds (34 Kg.) a dose of 5 grains three times a day is sufficient to prevent scarlet fever and should be given for four or five days after exposure.

In none of these cases were any controls used, nor did it seem advisable, since an epidemic was present and it has long been established that the disease is contagious.

It is realized that what is reported here is just a beginning, but there can be no question that sulfanilamide has a place as a prophylactic drug, as well as one to be used in the treatment of diseases.

L. E. Jewell, M.D., Meridian, Idaho.

STOMACH LAVAGE IN THE DIAGNOSIS OF TUBERCULOSIS

To the Editor:—The publication of "Stomach Lavage in the Diagnosis of . . . Tuberculosis" by Stadnichenko, Cohen and Sweany in the February 24 issue of The Journal reminds me again that workers in the field of tuberculosis seem to be oblivious of the earliest American work on the diagnosis of pulmonary tuberculosis by recovery of tubercle bacilli from the stomach contents.

In the recent article it is erroneously stated that in 1931 Vilhelm Clausen had the distinction of being the first to report results in adults. All recent writers seem to be unaware of the fact that sixteen years before that date a paper entitled "Tubercle Bacilli in Stomach Contents" appeared in the *Archives of Diagnosis* (8:154 [April] 1915), a journal now defunct. The senior author, Prof. I. H. Levy, of Syracuse, N. Y., is entitled to full credit for the idea. I was his assistant at the time and did the "mopping up."

John L. Kantor, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

THE "SAFE PERIOD"

To the *Editor*:—Will you please advise me what, in the light of present knowledge, is the likelihood of a woman with a twenty-seven to forty-five day menstrual cycle becoming pregnant from intercourse limited to the time during the menstrual period and the three or four days immediately following the period? I am thinking of the suggested possibility of extracyclic additional ovulation induced by intercourse. In the case in question a limited experience has indicated that this may be a sterile period.

M.D., Massachusetts.

To the *Editor*:—I am writing you concerning information asked of me by a patient with regard to the application of "the safe period of contraception." The patient's menstrual time varies from thirty to thirty-six days. Would it be possible for her to place any reliance on this method and if so what date should be avoided?

M.D., California.

ANSWER.—While the question of the reliability or unreliability of the "safe period" has been discussed for many years, its exact status is not yet fully clarified. In monkeys the reproductive phenomena are nearly identical with those in human beings and there is an opportunity for studying the question in an objective way. Investigations in women, however, have always been obscured by such subjective elements as the unreliability of menstrual dates and of dates of coitus. The value of many of the clinical reports with which the literature abounds is limited because of the uncritical attitude on these factors.

The first query poses two questions on which no clearcut evidence is available. The theoretical possibility of ovulation during menstruation is admitted even by laboratory investigators (Hartman) and a few clinical reports suggesting this possibility have been made, but Hartman states that in monkeys ovulation has never been observed before the eighth day or after the twenty-first day of the cycle.

The question of whether coitus may in man, as in such animals as the rabbit, be a determiner of ovulation has been discussed for many years, but no worthwhile evidence is available to substantiate this theory. Even if such coitus-induced ovulation took place, it would seem unlikely that it would be an "additional ovulation," i. e. that two separate ovulations would occur during the particular cycle.

To summarize the answer to the first query, therefore, it may be stated that coitus during the menstrual period and during the three or four days immediately following would be reasonably if not absolutely safe.

The second query necessitates a consideration of the whole fundamental concept of a "safe period" and of the evidence on which this is based. Only a few salient points can be referred to here. For fuller, though unfortunately sometimes unilateral, discussions the reader may be referred to the monographs of Ogino, Knaus and Latz. Among many articles reporting studies which cast doubt on the value of the method reference may be made to:

Bdalko, Michele: Die periodische Frucht- und Unfruchtbarkeit des Weibes, *Zentralbl. f. Gynäk.* **57**:2606 (Nov. 4) 1933.
Wintersteen, Franz: Ovulationstermin und Konzeptionsfähigkeit bei der Frau, *Arch. f. Gynäk.* **142**:446 (Sept.) 1930.
Stein, I. F.: Contraceptive Methods, THE JOURNAL, April 8, 1939, p. 1311.

An excellent review, written from the standpoint of the laboratory scientist, is to be found in the monograph by Carl G. Hartman "Time of Ovulation in Women" (Baltimore, Williams & Wilkins Company, 1936).

The present status of the question can be fairly summarized as follows: There is general agreement that in women who menstruate normally in cycles of approximately twenty-eight days (from twenty-six to thirty-two) ovulation probably rarely occurs before the eighth or after the twentieth day, that the ovum after being given remains fertilizable for not over twenty-four hours, and that the spermatozoon is incapable of fertilization for longer than about thirty hours after insemination. The evidence on this last point is based largely on animal studies and seems less convincing than that pertaining to the ovum.

There is, however, much uncertainty as to what happens in unusually long or unusually short cycles. Most authorities have felt that the corpus luteum phase is a fairly fixed one, of about two weeks (Hartman), while Schröder and others believe that in short cycles it is the corpus luteum phase which is short. This has an obviously fundamental bearing on the safe period doctrine, and the point is still unsettled. Add to this the notorious unreliability of menstrual dates, the variability of the intervals even in women who consider themselves regular, the possibility that ovulation may occasionally occur unusually early or unusually late, that it may possibly be precipitated by coitus, and many other moot points, and the relative uncertainty of the biologic method of contraception in many women can be readily understood. In such cases as that described in the second query, the proper advice would be that limiting intercourse to the week before an expected date gives much protection, and in this patient this would mean twenty-three days after the day of the preceding menstrual onset. To this might be added the suggestion that the few days immediately following menstruation should carry no great risk. Too much stress cannot be placed on the importance of keeping accurate menstrual dates for at least a year before beginning the method, when this is feasible. The question has many other ramifications, which cannot be discussed in this short space.

In fine, it may be said that in women with reasonable normal menstrual cycles of from twenty-six to thirty-two days the method is of much value, though almost certainly far from infallible. In women with irregular periods its value is definitely less.

TREATMENTS OF AND SURGICAL PROCEDURES IN HEMOPHILIA

To the *Editor*:—Kindly discuss the effectiveness of newer procedures other than transfusions in the lowering of clotting time in hemophilia. Within the last two years or so, several articles and abstracts have appeared in The Journal concerning the effectiveness of the following in lowering or shortening the clotting time in hemophilia: (*a*) Female sex hormone; theelin and corpus luteum. (*b*) Extract from egg white; also a potassium bromide and egg white mixture. (*c*) Histidine. (*d*) Vitamin K. (*e*) Snake venom. (*f*) Thromboplastin. Is there any contraindication to the treatment of varicosities in hemophilia, hemorrhoids and varicose veins of the legs with the injection of sclerosing solutions?

Eugene J. Dorst, M.D., Bethany, Ill.

ANSWER.—There is at present no specific therapy for hemophilia, for the exact nature of the defect in the blood clotting mechanism of hemophilic blood is still unknown. Blood transfusion is still the only certain method for reducing the clotting time. However, recent research by Patek, Pohle and Taylor (*J. Clin. Investigation* **16**:113 [Jan.], 741 [Sept.] 1937), Bendien and van Creveld (*Am. J. Dis. Child.* **54**:713 [Oct.] 1937) and Howell (*Bull. New York Acad. Med.* **15**:3 [Jan.] 1939) has pointed to the existence in normal blood of an unknown substance which hastens the clotting process but which is lacking in hemophilic blood. This has been named by the respective authors "globulin substance," "coagulation globulin" and "plasma thromboplastin." Intravenous injection of an extract of blood containing this factor has successfully lowered the clotting time of hemophilic patients to normal or toward normal for several hours or days. Howell states that the future for successful therapy of hemophilia lies in the isolation and purification of a globulin substance or thromboplastin which can be used safely for blood transfusion. None of the other substances mentioned in this query have yielded consistently good results when tried by others.

(*a*) Female sex hormone and ovarian extracts were advocated by Birch (THE JOURNAL, Nov. 5, 1932, p. 1566) and recently by Kocsis and Hassko (*Deutsche med. Wchnschr.* **64**:1284 [Sept. 2] 1938) on the assumption that there is an endocrine basis in this disease, since it occurs only in males. However, the good results reported by them could not be corroborated by other investigators (Stetson, R. P.; Forkner, C. E.; Chew, W. B., and Rich, M. L.: THE JOURNAL, April 7, 1934, p. 1122) and Howell.

(*b*) The report of Timperley, Naish and Clark (*Lancet* **2**:1142 [Nov. 14] 1936) on the use of an extract prepared from egg white treated with potassium bromide has already been discussed in THE JOURNAL (Nov. 19, 1938, p. 1953). Confirmation of their successful results is as yet not available.

(*c*) Kohl (*Ztschr. f. klin. Med.* **132**:40 [No. 1] 1937) claimed a successful result with histidine, but Bloch and Necheles (THE JOURNAL, July 17, 1937, p. 204) failed to demonstrate any effect of histidine on blood clotting.

(*d*) Vitamin K has had no effect in reducing the clotting time or the bleeding tendency in hemophilia. This is as one would expect, since no deficiency in prothrombin or vitamin K has been demonstrated in this disease (Dam and Glovind, *Lancet* **1**:720 [March 26] 1938).

(*e*) The parenteral administration of moccasin snake venom is not advocated in hemophilia. This venom fails to facilitate

blood clotting but acts directly on vessel walls. However, the local application of the diluted venoms of Bothrops atrox (Peck, S. M.; Crimmins, M. L., and Erf, L. A.: *Proc. Soc. Exper. Biol. & Med.* **32**:1525 [June] 1935), tiger snake (Rosenfeld, Samuel, and Lenke, S. E.: *Am. J. M. Sc.* **190**:779 [Dec.] 1935) and Russel viper (MacFarlane, R. G., and Barnett, Burgess: *Lancet* **2**:985 [Nov. 3] 1934) has been found efficacious in producing blood coagulation and in arresting external hemorrhage from the skin, gums and nose and after dental extractions.

(f) The effect of the parenteral administration of plasma thromboplastic substance has been discussed. More experience is needed to determine whether it can actually replace blood transfusion. The local application of tissue thromboplastin has also been found of value in uncontrollable external hemorrhage. Howell claims that a glycerin extract of dried lung is the most potent preparation for this purpose.

In answer to the last question, it is generally agreed that elective surgical procedures should not be undertaken in hemophilia, for an otherwise harmless procedure may lead to uncontrollable hemorrhage. However, if varicosities of the leg produce serious discomfort or disability not alleviated by elastic supports or bandages, injections of a sclerosing solution may be attempted. Venipuncture in hemophilia results in uncontrollable bleeding in only rare instances. Particular care should be taken not to produce a superficial slough which may bleed easily, to collapse the vein by gravity before injecting into it, and to approximate immediately the sclerosed surfaces by direct pressure. Similar considerations apply to hemorrhoids. Conservative measures, such as diet, liquid petrolatum and suppositories, should be tried first. If the hemorrhoids bleed excessively, injections should be attempted, great care being taken not to produce a slough of the mucous membrane.

APHAKIA

To the *Editor*:—Is there a table showing the percentage of visual loss following a cataract extraction? For instance, a visual acuity in a non-aphakic eye of 20/25, according to my chart, would be 95.6 per cent. In an aphakic eye when the other eye is normal it is practically impossible to wear a correcting lens without having a diplopia. For all practical purposes, then, an aphakic eye even though it should have a visual acuity of 20/25 would still be of little use to the patient, as he would not have single binocular vision. This, then, would leave the patient with a much greater disability than the same percentage of vision in an eye without a cataract extraction. I am caring for a patient for the Oregon state industrial accident commission who developed a cataract following an injury to one eye. I removed the cataract, and with glasses he now has a visual acuity in this eye of 20/25. He also has a round pupil. The commission has asked me to report the industrial amount of visual loss for this man, but I have been unable to find any table for loss in an aphakic eye. The vision in the other eye is normal. I would greatly appreciate any information you can give me regarding this.

Frank L. Ralston, M.D., La Grande, Ore.

ANSWER.—The inquirer may be referred to the report on "Appraisal of Loss of Visual Efficiency—Standard Method Approved by the House of Delegates of the American Medical Association, May 26, 1925." On page 4 of that report is the following paragraph:

> If there exists a difference of more than 4 diopters of spherical correction between the two eyes, the best possible vision of the injured eye without glasses or with lenses of not more than 4 diopters spherical difference from the fellow eye shall be the acuity on which subsequent rating is to be computed for this injured eye.

The committee that compiled the report recognized the image size difference that exists between a normal eye and an aphakic eye with correction. It was realized that the resultant loss of the simultaneous use of the two eyes necessitated compensation and the paragraph quoted was believed to be the fairest means of attaining that end.

CENTRAL CHORIORETINITIS AND STREPTOCOCCIC INFECTION

To the *Editor*:—Please advise as to the possibility of a central chorioretinitis, both eyes, being caused by a streptococcic infection. In the case under consideration a man aged 62 had a hemolytic streptococcus infection in 1932 and has experienced gradual loss of vision since that time. All laboratory examinations were negative.

Grover C. Swaat, M.D., Herston Heights, Cana.

ANSWER.—A central chorioretinitis due to streptococcic infection must be a great rarity although it is theoretically possible; however, in a man of 62 with such an undermining condition various secondary causes must be thought of. A moderate degree of arteriosclerosis, existing before such an infection, may be so disturbed that nutrition of the central macular area with degeneration of the visual cells is quite likely. Other conditions to be considered are glaucoma, toxic amblyopia such as alcohol, and tobacco poisoning and allergic states. With recovery from the streptococcic infection it would seem unlikely that gradual loss of vision since 1932 could be attributed to such a source.

MOTILE CELLS IN URINE SPECIMENS

To the *Editor*:—Frequently I find motile cells in urine specimens. These are slightly larger than leukocytes and are either oval or round. The oval cells are flat and move either by turning over and over or by spinning. The round cells move in a straight line and the means of locomotion is not visible. Heat destroys motility. I can find no information concerning these motile cells and would appreciate any you may have on the subject.

E. C. Heinlich, M.D., St. Paul, Neb.

ANSWER.—It is difficult to state just what these motile cells might be. It seems reasonable to assume that they are most likely Trichomonas vaginalis organisms, as they have frequently been noted in the urine of patients both male and female. It is also of interest to note that they may be found at times without any local symptoms.

RESISTANT HAND INFECTION

To the *Editor*:—Can you give me some assistance in the matter of etiology and treatment of a case involving the fascia and tendons of the hand resulting from an injury? About two years ago a man of Spanish blood, born in Chicago and aged 53, had the right index finger badly mangled between two lengths of pipe while employed by the road commission. The contract surgeon dressed the finger, which became infected and after a period of two or three weeks was amputated at the second phalangeal joint. The wound refused to heal and after x-ray examination and treatment was subjected to a second amputation at the middle of the proximal phalanx by still another surgeon. This wound has refused to heal and though repeated x-ray examinations reveal no bone involvement, sinuses continued to recur and heal about the end of the stump. Great tenderness exists in the stump and various nodules the size of a bean have developed along the tendons of the palm and wrist, up to a point above the annular ligament. These too are tender, and contractures of the palmar tendons of the index, second and fifth fingers have developed. The patient has been under the care of a number of excellent surgeons and has had extensive blood examinations and cultures. Repeated Wassermann tests have been negative, as also are blood cultures and smears and cultures from the sinuses of the stump. Sulfanilamide proves unavailing, as does all other medication that has been tried. Any suggestions or assistance that you can give me will be greatly appreciated.

M.D., Utah.

ANSWER.—The patient may be suffering from some unusual type of infection, such as one of the sporotrichum group, or from an anaerobic streptococcus infection. If cultures of the wound discharge made under anaerobic conditions do not reveal the cause of the trouble, special cultures on suitable mediums should be carried out.

The symptoms, and particularly the appearance of nodular enlargements proximal to the site of primary infection, suggest the possibility of infection due either to a sporotrichum, to some other form of fungus, or to organisms of the Actinomyces group.

F. L. Meleney, of New York, has written extensively of the infections due to the anaerobic streptococcus and their symptomatology, course and treatment.

TIME OF OPERATION IN CHOLECYSTITIS

To the *Editor*:—Is it good surgery to remove an acute empyema of the gallbladder? A city surgeon has "bugged me," so to speak. A woman of 52 with blood pressure ranging from 140 to 220 systolic and from 90 to 100 diastolic entered and had the gallbladder drained. Three and a half months later another surgeon, after doing the cholecystectomy, advised the family that the first man should have done the whole job originally. Who is right? I am in the middle.

M.D., Connecticut.

ANSWER.—The question as to when to operate in gallbladder disease is one concerning which there is a good deal of debate at the present time. The sequence of events in acute cholecystitis is commonly as follows: A stone becomes impacted in the cystic duct or in the ampulla, the gallbladder is obstructed, and the continued secretion of mucus by the gallbladder mucosa distends the viscus to the point of interference with its blood supply, leading to swelling and edema of the wall, local areas of necrosis or gangrene and in some cases to perforation. Infection is a minor factor since the imprisoned bile contains few or no organisms, the situation thus differing from that in the case of the appendix. Operation may be done immediately, an opinion voiced by an increasing number of surgeons, and the gallbladder can be removed without undue hazard from infection. It is thus good surgery "to remove an acute empyema of the gallbladder." On the other hand, the great distention of the gallbladder and especially the swelling and hyperemia of the wall and the loose areolar tissue about the cystic and common bile duct may well justify cholecystostomy as involving less risk of injury to the common duct. The general condition of the patient and particularly the behavior toward the anesthetic are factors which also must be taken into account. The second surgeon had no right to "advise the family that the first man should have done the whole job originally."

CONVULSIONS IN INFANCY

To the Editor:—A patient 2½ years of age has had, according to the mother, about four spells daily since 1 year of age consisting of momentary facial pallor, bending over but no loss of balance and occasional left arm rigidity, followed by twitching and lateral deviation of the right eye. There is no loss of consciousness or loss of vesical or rectal contents. I had occasion to observe the patient during an attack in the office which lasted about a half minute in its entirety. It was as described except that the patient lapsed into deep sleep after the attack. The patient was delivered normally at nine months. Physical examination showed no abnormality. The reflexes were all apparently normal. There is no history of birth injury or epilepsy in the family. Since the attacks resembled those of petit mal, the patient has been treated with sedation and a high caloric, high vitamin diet, with no apparent benefit to date. What would you consider in the differential diagnosis? What prognosis could be offered at this time? What would be the best line of treatment to follow?

M.D., Michigan.

ANSWER.—Major, minor or jacksonian seizures occur frequently in children and usually have no localizing value even though a brain tumor or brain abscess may be present. The description of the attack in this case is that of a major seizure with motor auras, that is, twitching and lateral deviation of the right eye with an occasional left arm rigidity. This points to a lesion either in the premotor or motor area of the right side of the brain or in the pontile region. The patient should have a complete neurologic examination and either ventriculographic or encephalographic study for the purpose of ruling out a surgical lesion of the brain. If no such lesion is found, the patient has epilepsy of undetermined origin and should be observed. Sodium bromide or phenobarbital might be helpful.

SENSITIZATION TO TATTOOING PIGMENT

To the Editor:—A man aged 22 was tattooed on the left arm two years ago. Six months ago he was tattooed a second time, in New York. After the operation the mark went through the usual period of healing and no more trouble was experienced. Now, two weeks ago, he submitted himself to a third session of tattooing—this time on the right arm. Two days after this operation a curious phenomenon occurred. All the areas in which red dye was incorporated by the needle became swollen, irritated and itchy. This was noticed not only in the operation of two weeks ago but also in those done two years and six months ago. The man has no general body eruption but he has a painful inguinal adenitis. I have seen him only today and will not see him again as he leaves for abroad tomorrow. Why should this patient suffer, what I believe to be, an acute dermatitis to areas of the skin stained red following his latest tattooing?

William J. MacDonald, M.D., Boston.

ANSWER.—This phenomenon is a fine example of sensitization occurring after two years of exposure to a red pigment. During that time no general sensitization took place; but the third deposit of the dye resulted in the formation and liberation of antibodies specific for this substance. The consequence was the irritation of the tissues about the red deposits, swelling and nerve stimulation. All the elements of sensitization are demonstrated, incubation period, reaction at the point of latest inoculation and simultaneous reaction about all other deposits of the same dye. This may be cinnabar, a sulfide of mercury also known as vermilion, commonly used as the red pigment in tattooing.

FRUIT JUICES AND ALKALIZATION

To the Editor:—Please explain why fruit juices which are acid act as an alkali in the stomach. A patient of mine, who is a chemist, claims that this acid must unite with calcium in bones to give an alkaline reaction.

M.D., Rhode Island.

ANSWER.—Fruit juices do not act as an alkali in the stomach. Their acidity is due to organic acids which form salts on reaching the alkaline medium of the small intestine. When these salts of the organic acids are absorbed the acid radicals are metabolized, leaving the alkaline ions free. Thus fruit juices, while acid in reaction, are "alkaline ash" producing foods. There are exceptions such as prunes and cranberries, which are "acid ash" foods because they give rise to hippuric acid as one of their end products.

However, even if the diet is of preponderantly "acid ash" nature, it does not follow that calcium need be liberated from the bones for purposes of neutralization. The body has several mechanisms to deal with the ordinary excesses of acid catabolites. Chief of these is the ability of the kidney to excrete a highly acid urine. This organ can also produce ammonia with which to neutralize acids before excretion. It is only when the compensating mechanisms of the body are overcome, by extreme or prolonged acid intake or by pathologic acid formation in the body, that it becomes necessary to draw on the calcium, sodium and potassium of the bones to replenish the alkali reserve of the blood.

MANDELIC ACID AND EPILEPSY

To the Editor:—Has mandelic acid ever been successfully used as a substitute for the ketogenic diet in the treatment of epilepsy?

M.D., Ontario.

ANSWER.—Mandelic acid has been used as a substitute for the ketogenic diet in an attempt to produce a similar effect. While no reports have been published, mandelic acid has been tried and found to have no effect on the convulsions of epilepsy. It is well known that mandelic acid is excreted unchanged in the urine. It is not conjugated or metabolized, therefore it does not produce the ketosis or beta-hydroxybutyric acid which is the aim of the ketogenic diet. Peterman demonstrated that acidification produced with ammonium chloride or with an organic acid carbon atom fat had no effect on the seizures of epilepsy. After Cook had shown the bactericidal effect of the urine of some patients on the ketogenic diet, Rosenheim found an organic acid (mandelic) which was excreted intact and gave the urine bactericidal properties. However, this acid does not produce a ketosis or ketonuria, which seems to be essential to produce results in the treatment of epilepsy.

WHOOPING COUGH VACCINATION—CARRIERS NOT RECOGNIZED

To the Editor:—After immunization with Sauer's vaccine in the recommended dosage, can a child contract a subclinical case of pertussis and so be a carrier of that disease?

Edward B. Moten, M.D., Salem, N. Y.

ANSWER.—After inoculation with Sauer's vaccine according to the recommended dosage, it is believed usually that a period of four months must elapse before immunity is established. Consequently, if the inoculated child was exposed to whooping cough before the lapse of four months, protection would not be assured. It is also possible that, after a period of four months from the time inoculations were completed, some children might develop whooping cough in a modified form. The disease could also occur without the characteristic whoop and yet be contagious. Generally the existence of pertussis carriers is not acknowledged. As a rule the organism responsible for whooping cough is seldom transmitted from a patient to a susceptible individual for a period of more than two weeks following the onset of the paroxysmal stage.

OILY VEHICLES FOR NASAL SPRAYS

To the Editor:—With regard to lipoid pneumonia I have a compressor vapor spray outfit in which the oil is formed into a fine nebula and inhaled, filling the lungs. Liquid petrolatum is now used as a base for the spray. I am going to change to a vegetable oil and was thinking of using cottonseed oil. Would that be acceptable?

M.D., Oklahoma.

ANSWER.—If an oil is to be used as a base for a nasal spray, a vegetable oil is certainly preferable to mineral oil. There is now abundant evidence that mineral oil in the lungs acts as a foreign body, causing interstitial fibrosis and giant cell formation. There are several instances on record in which the fibrosis has been so severe as to warrant the use of the term paraffinoma of the lung. On the other hand, Pinkerton and others have shown that vegetable oils can be metabolized by tissue enzymes and for that reason do not act as foreign body irritants. Cottonseed oil might be used, although the fact should be borne in mind that a good many patients are sensitive to this oil. One wonders why an oily spray is necessary at all, since all the vasodilators and so-called antiseptics can be dissolved in salt or dextrose solutions. There is no evidence that substances dissolved in these fluids cause any harm to the respiratory tissues, and their use would seem to be a more physiologic type of therapy than that in which foreign oily material is introduced intentionally into the respiratory tract.

REMOVAL OF MERTHIOLATE STAINS

To the Editor:—Following is a formula for the removal of tincture of merthiolate stains:

Hydrochloric acid (concentrated) 3%
95% alcohol ..... as much as will suffice

or

Hydrochloric acid (concentrated) ..... 10 cc.
95% alcohol ..... sufficient to make 300 cc.

To remove the stain moisten a piece of gauze with the solution and rub the stained tissues with a fair amount of pressure. This will remove most or all of the stain.

Myron Metzenbaum, M.D., Cleveland.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Sixth Annual Meeting, held in Chicago, Feb. 12 and 13, 1940
(Continued from page 1401)

Dr. Fred Moore, Des Moines, Iowa, in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

February 13—Morning

Cancer in the Medical Curriculum

Dr. Ludvig Hektoen, Washington, D. C.: What should the medical student know about the cancerous diseases when he completes his course? He should have a good idea of their significance as social and medical problems. The importance of early diagnosis and prompt treatment of cancer should be so deeply stamped on his conscience that henceforth he will act under an acute sense of the gravity of his responsibility as to cancer. He should understand that accessible cancer is curable in the early local stages while practically 100 per cent fatal in the disseminated forms, and that the advance from the favorable to the unfavorable stage may take place within a very short and uncontrollable space of time; also that today cancer is not a one man job. The diagnosis and treatment require cooperatively organized and well equipped services; consequently the physician who is not specially trained in that field is in duty bound to refer his cancer cases and suspected cancer cases without delay to physicians who have the needed skill, experience and facilities. He must sense at once the need of consultation with respect to cancer. He should have enough understanding of the fundamentals of roentgenology and of radium therapy to know that, like surgery, these agents are safely effective only in the hands of those who are skilled in their use under different conditions.

When the student leaves medical school he should definitely realize also the responsibilities that rest on him with respect to the prevention of cancer. Is the prevention of cancer receiving adequate attention in the medical curriculum?

The oncoming physician should be well informed about current activities toward cancer control. It is essential that he understand the nature and scope of the organized efforts by private, state and federal agencies, now spreading into communities everywhere, toward the better control of cancer by education of the public, by instruction of doctors, by legislation, by the provision of treatment centers, by research. That we are in the midst of a determined effort to advance the control of cancer is of immediate concern to every physician. It is important that the coming physician be prepared for an intelligent part in the general anticancer program. He should be informed about the nature and significance of the steadily growing movements of our time toward specialized clinical cancer service and the establishment of the cancer institutes and clinics. He will be concerned in the accessibility for his community of reliable centers for the diagnosis and treatment of cancer as well as in the increase of approved cancer clinics in general hospitals. And he will not lose sight of his responsibility in the medical and social follow-up of his cancer patients at intervals during their lifetime.

Cancer occupies many places in the curriculum. The basic teaching as to its nature and structure is given in the department of pathology. The manifestations, diagnosis and treatment of cancer receive attention in every clinical branch. As yet cancer as a social and public health problem does not receive proper consideration in the medical course. The teaching of cancer in medical schools needs better organization to give the students a broader, more realistic conception of cancer and of the present methods of the diagnosis and treatment of its various localizations, forms and stages. This statement applies also to hospitals approved for internships. There can be no question that hospitals with approved cancer clinics should be preferred for general internships.

Different plans have been suggested to advance the teaching of cancer to students. It has been proposed to establish a department or chair of oncology. Another plan is to place the teaching under one competent head, who is to be given general control of enough material for a systematic course of instruction. In the meantime, pending future developments the teaching of cancer should be advanced by better correlation of the agencies concerned. In such advance the cancer clinic in the general hospital will play a most important part. The cancer clinic has been developed to provide equipment and organized cooperation in clinical work. Here diagnosis, treatment and follow-up study are carried on under the guidance of specialists in diagnosis and pathology, surgery with its subdivisions and radiology. Pathologic and clinical conferences, group or combined clinics as a rule cannot meet the needs of the medical student as fully as the permanent, well organized cancer clinic.

Some Criteria on the Selection of Medical Students

Dr. Irving S. Cutter, Chicago: This article appeared in full in The Journal, March 23, page 1123.

The Recognition of Professional Aims in the Teaching of the Fundamental Medical Sciences

Dr. M. B. Visscher, Minneapolis: All educational enterprises and practices fundamentally are, and must be, compromises between the two conflicting ideals of perfect training and of reasonably short periods of training. The pattern for medical education in America was cut in the late nineteenth century after the European model, largely the German one. It has been modified since, but it has never been gone over completely in the light of the changed character of medical science itself and the changing trends of medical practice. There are many reasons why medical schools have not fundamentally altered their pattern of teaching. The new is dangerous. Changes in emphasis mean shifts in the relative importance of one or another branch. The vested interests of a guild often prevent progressive change. In education the traditional independence of the departmental units is often a bar to alterations. The assumption that specialists in a given branch are the most competent to know the relative importance of that division of knowledge in the training of professional students is dangerous.

In the prevailing pattern of medical education today in the preclinical sciences, the morphologic sciences receive much more attention than do the functional ones. There would be no point in stating this fact if it were not for the observation that there is widespread dissatisfaction with physiologic teaching in medical schools. The prevailing sentiment is that from the physician's standpoint the physiologic sciences are not properly handled in the medical curriculum. This dissatisfaction results mainly from one cause—the increasing importance of physiologic information to the diagnosis and treatment of disease. This change in the character of the physician's thinking about disease is perhaps the most significant alteration in medicine in the past half century. It has had repercussions on the character of medical education. The dynamic aspects of disease cannot be given emphasis unless anatomy becomes, or at least includes, functional anatomy, unless pathology includes functional pathology, and unless time is provided for teachers in the physiologic sciences to cover the problems of deranged function.

Until recently the assumption by fundamental science teachers in medical schools was that their function consisted in teaching students all there was to know about the particular branch under consideration. My main thesis is that the entire fundamental medical science curriculum deserves to be rebuilt on the premise that only those things should be included in the subject matter of the curriculum in any of the special branches which are fundamental to the understanding of clinical medical problems and that their emphasis should be determined by their relative importance to the professional objectives. Such a for-

mula will not simplify the problem of determining the content of preclinical courses. In fact, the problem has been made more complex. It is the advance in knowledge which is responsible for our difficulties. In general the older branches of the fundamental medical sciences are particularly cluttered up with traditions in the content of courses. Anatomy, physiology, pathology and the older pharmacology are full of hoary old customs in this regard. An example may be found in the mechanical aspects of muscle contraction. Muscle-nerve physiology is important as a means of studying the principles of the behavior of excitable systems, but the emphasis placed on many points has been exaggerated. I question the utility of the study of long lists of little used agents in pharmacology or the detailed study of the origin, insertion, innervation, blood supply and relations of every muscle in the human body.

Again risking censure, I suggest that the attention paid to histologic diagnosis of neoplastic diseases in pathology is unwarranted on the scale of relative usefulness. It is no more important to know about the cytology of a tumor than it would be to know about its characteristic metabolism. The number of physicians competent to make a histologic diagnosis of tumors is vanishingly small. The job today is turned over to a specialist.

However much we regret it, the fact is that no physician could be technically competent to do the laboratory procedures, and other special studies on the basis of the results of which diagnoses must be made. There are still voices crying that it should be possible, but the species of physician that had these several capacities adequately developed vanished with the rise of modern medicine. This point has an important bearing on the philosophy of medical education. If one insists that a physician must be a universal expert, then there is no detail more or less important to him than any other. Then nothing less than complete familiarity with all available knowledge will do. I am by no means suggesting that a physician should not be competent to carry on some simple laboratory studies himself or that he should not be acquainted with the principles of all of them, because I believe he should; I am only arguing that it is unreasonable to expect him to have the technical competence to carry on many of the more ticklish ones satisfactorily. The very existence of a large number of professional clinical pathologists would seem to be proof that the great body of physicians themselves agree with this thesis.

A part of the responsibility for teaching physiology belongs to the clinician. It is never the responsibility of preclinical science teachers to integrate knowledge in relation to a specific disease situation. That is obviously the job of the clinician. I have purposely spoken of "applicable" material rather than "applied physiology" or "applied bacteriology." Applied physiology is an integral part of clinical medicine. The clinical teacher can never be relieved of his ultimate responsibilities in the integration of knowledge from the several fundamental disciplines. With further advances in the understanding of the processes of disease, the clinician will necessarily have to assume increasing duties in the teaching of applied biochemistry and physiology.

It seems fairly obvious that the progress in medical science has altered the relative importance of the several fundamental sciences and of the several divisions of those sciences; that the widespread discontent over the adequacy of teaching of functional phases of the preclinical sciences is due to several causes, one of which is the failure of teachers to determine emphasis on the basis of professional significance, and another is the relatively inadequate portion of the medical curriculum devoted to functional or dynamic as opposed to descriptive studies. There is no simple solution to these problems. Our task as medical teachers is to face the situation with a willingness to restudy our objectives and to revamp the curriculum in the light of contemporary rather than historical needs.

Opportunities for a Medical Career in the Federal Civil Service

DR. A. RAY DAWSON, Washington, D. C.: The objective of the federal civil service, or merit system, is to provide the public service with the best qualified personnel possible. When a department or independent establishment notifies the commission that it will need a certain number of physicians to fill its contemplated vacancies, this notification starts the commission's machinery toward supplying the need. An examination announcement is written. Announcements of examinations and application forms may be obtained from any first class post office and by writing the Civil Service Commission at Washington, D. C., or any one of the thirteen district offices of the commission in principal cities of the United States. When the commission has determined that a physician meets the minimum requirements there are then sent out certain confidential vouchers. One of the mimeographed sheets is sent to the dean of the college from which the applicant graduated and one is sent to the superintendent of the hospital where the applicant served his internship. In addition, the commission uses letters of inquiry and whatever other available means it has of obtaining information. After the information has been obtained and assembled, the applicant is rated on the basis of education and experience according to a prearranged schedule. One difficulty the commission experiences in filling positions is caused by the restrictions placed by eligible physicians themselves on the geographic area in which they will accept appointment. If a doctor states he will accept appointment only in New York City he is usually not certified to a department wishing to fill vacancies elsewhere. A frequent question is What fields or branches of medical practice are available in the civil service? My answer is all of them, from general practice to the highly specialized fields. If the young man wishes to prepare himself really well for a medical career and is not afraid of hardships, the Indian Service offers the finest opportunity of which I know for the practice of general medicine. This service maintains fourteen sanatoriums for tuberculous patients and eighty-eight general hospitals, including seven in Alaska, ranging in size from twelve to 250 beds with an average of fifty beds. The majority of full time physicians are attached to hospitals, where opportunity is available for intensive experience in all phases of medicine. In addition, most hospitals maintain a very active outpatient department, and home calls, field trips, school examinations and general sanitation constitute an important part of the work, with valuable experience in general practice, home care, administration and public health procedures. Some physicians are assigned to more or less isolated field stations. Additional treatment, consultation and health education in trachoma and tuberculosis are in charge of a corps of special physicians.

There are available appointments in Panama, in Alaska, on board ship, in coast and geodetic survey, and in the census bureau. The largest number of physicians employed by the government are in the fields of general practice, tuberculosis, psychiatry, surgery, public health and, to a less extent, in all of the other specialties. I should like to stress the increasing need for men trained in industrial medicine.

The opportunities for research are excellent, and these opportunities are to be found in practically every department or independent establishment employing civil service physicians. I have but to mention a few examples for you to remember much of the detail of the work that has been accomplished in Rocky Mountain spotted fever, chest surgery, cancer, syphilis, food and drug administration, child welfare and, of course, the large field of sanitation and public health.

The modern emphasis in the federal service is on career service; therefore "in-service training" is playing a large part. "In-service training" has been developed to perhaps its widest extent in the Veterans Administration, which at present is operating a tumor clinic at Hines, Ill., neuropsychiatric clinics at various hospitals, a heart research and clinic establishment at Mount Alto Hospital in Washington, D. C., chest surgery at certain of the tuberculosis hospitals, and in addition to this offers many opportunities at other facilities. The opportunities for training in psychiatry at St. Elizabeth's Hospital, under the Department of the Interior, are, as you know, second to none.

At the close of the fiscal year June 30, 1939, there were sixteen regional offices and eighty-four facilities under the jurisdiction of the Veterans Administration, and 54,117 patients

receiving hospitalization. On completion of new construction for which funds are available, there will be 63,110 hospital beds and 19,464 domiciliary beds, a combined total of 82,574.

To create medical staffs for operation of its newly constructed facilities, to handle the steadily increasing patient load and to fill vacancies created by death, disability or age retirement, the Veterans Administration requires a constant reservoir of young physicians. This need will be urgent for the next twelve months, during which period positions to an estimated number of 300 are proposed. Appointment is subject to a probational status of one year, on the satisfactory completion of which permanent assignments are made. The appointee is first sent to the nearest facilities of the Veterans Administration, at which he is given a training course. If he is found to have the professional and personal qualifications and to be physically able to discharge his duties, permanent appointment is in order. The volume of the medical activities of the Veterans Administration is enormous. Veterans of former wars constitute a public of 4½ million persons who are potentially entitled to treatment.

A young physician entering the federal government for a career cannot expect to get rich quick, but he can look forward to a lifetime of adequate remuneration. His hours of employment will be satisfactory, he will have twenty-six days a year annual leave with pay, which is cumulative to sixty days, and he will have fifteen days a year sick leave with pay, which is cumulative to ninety days. When we consider lifetime employment and lifetime income with the other various features we find that the physician employed by the federal government does much better economically than the average in his profession, and in addition he is enabled to lead a life removed from many of the worries that surround private practice, a life in which he has time outside of working hours to devote to research projects of his own, to hobbies or other pleasures of life.

How the Children's Hospital Can Best Meet Community Needs

DR. ALAN BROWN, Toronto: The contribution of a children's hospital to a community, in my opinion, can probably best be demonstrated by a description of our organization as it exists today. In 1919 the staff of the Hospital for Sick Children was reorganized and plans were laid to establish this hospital along the lines of a center for children's work, the idea being to embrace antepartum care, care of the newborn infant, and care of the child through the period of adolescence. In addition, we felt that we should cooperate with all government and child care institutions. The first big step was the realization that the baby as soon as it was born should become a pediatric problem. The result was that the Toronto General Hospital newborn clinic was established at the beginning of 1919; since then the newborn clinics of all the general hospitals in the city have been incorporated in this scheme directed from the children's hospital. The result of this procedure has been a reduction in the neonatal mortality to around 24 per cent. This figure is now considered almost the irreducible minimum. The Child Welfare Clinics in the city of Toronto have resulted directly through the interest of the children's hospital in this phase of preventive work. All physicians manning the twenty-six clinics are trained and directed from the children's hospital, and the same applies to the nurses.

About this time the medical director of the children's hospital was made consultant in child hygiene to the School of Hygiene, University of Toronto, the Dominion Department of Health and the Provincial Department of Health, thus enabling practically all phases of children's problems to be guided from the children's hospital. It was suggested to the children's aid societies and children's homes that they be staffed by members of the staff of this hospital. This has been accomplished. As a further effort in cooperation, the physician in charge of infectious diseases in our hospital has been for years physician in chief of the municipal isolation hospital. A small research laboratory was founded in 1917. This has been expanded and since 1919 has been under the Department of Pediatrics of the University of Toronto Faculty of Medicine, the laboratories being situated in the hospital. At present there are working in the research laboratories ten full time pediatricians, one chemist, one physiologist and seven technicians. The principles laid down early were that all research problems should relate directly to the prevention of disease and the better care of sick infants and children. During the past eighteen years 300 papers have been published dealing with scientific research problems which have been investigated, the most important of which were the development of the infant food Pablum and original studies on the use of sunshine, skyshine and vitamins.

The professor of pediatrics in the University of Toronto Faculty of Medicine is the physician in chief of the hospital. All the teaching of medical students, postgraduates and nurses from all the general hospitals in this city takes place in this institution. In addition to this, public addresses are given to various service clubs, home and school clubs, and other associations requiring speakers, on every phase of children's work. In 1938 members of the staff of the Hospital for Sick Children gave forty public addresses in different parts of the city and country. One is quite safe in saying that this hospital is applied to for all sources of information regarding children's care from all parts of the dominion. The surgeon in chief of the children's hospital has under his direction all the various surgical specialties that are necessary in such an organization. The care of the sick child is under the direct supervision of ten full time pediatricians and eight attending pediatricians, three neurologists and three dermatologists. This arrangement naturally insures the best of care for the children in the wards. The Junior League of Toronto supplies forty voluntary workers each week to assist in the various clinics of the outpatient department of the hospital, to do occupational therapy work under the direction of a trained therapist on the wards of the hospital, and to collect breast milk throughout the city and bring it to the milk department. In the year 1936 the hospital treated 8,345 cot patients, representing 139,747 patient days. In the same year 8,117 operations were performed, and 98,351 treatments and examinations were given in the outpatient department.

The Integration of Preventive Medicine in the Education of the Physician

DR. S. P. LUCIA, San Francisco: Medicine is a social as well as a natural science. The physician must give as much weight to the study of normal man and his reactions to an ever changing environment as he does to the study of the physiologic mechanisms of biologic phenomena, illness and death. The well-being of man is the responsibility of medicine. The medicine of the future demands socially minded physicians who will work with heart as well as with intellect. Let not technic supersede reason. The physician's view should be more telescopic and less microscopic, as the line between preventive and curative medicine cannot be drawn sharply. Likewise the physician's responsibility to the individual or to the community cannot be differentiated clearly.

The artful diagnosis and empiric therapeutics of the past have given way to the more scientific therapeutics of the present. The science of diagnosis has absorbed or displaced many subjects in the curriculum of a modern medical school. Consequently the physician centers his interest on cure rather than on prevention, on the individual rather than on the group, the environment and other factors of equal importance. There must be a revision of curriculums so that equal weight may be given to prevention, diagnosis and therapeutics.

The curriculums of medical schools are to some extent stereotyped. The organization of the various divisions is vertical, so to speak, and they are more or less isolated as units of surgery, medicine, pediatrics, obstetrics, gynecology and other subjects. The department responsible for teaching preventive medicine fails in its purpose if it is not horizontal and if the major emphasis is not placed on the integration of its services with the special services of the general field of medicine. It is in the division of preventive medicine that all medical, psychologic, social and economic influences on man should be considered.

It is an obligation of the modern medical school to teach preventive medicine in the undergraduate curriculum and to accord it a place of major importance along with diagnosis and therapeutics. The application to the individual of the principles of preventive medicine obtained from the knowledge of control of disease in the group is the ultimate aim. One must not confuse this field with the field of public health. It is a part of public health. The field of public health is a specialty, best taught in the postgraduate years. The excellence of public health depends on the excellence of the preventive medicine practiced by the practitioner of medicine. The social consequences of medical practice make it necessary for the physician to have the broadest possible technical training and to carry his interests beyond into the subjects of poverty and its control, housing and its effects on health, the social and health problems of mobile populations, the philosophy of social security, and problems concerned in a more adequate distribution of medical services. Frequently environmental, psychologic, social or economic factors may represent the essential contributing elements in the health of an individual. Their consideration is important in diagnosis, prognosis and treatment.

The plan of instruction in the division of preventive medicine at the University of California extends through the sophomore, junior and senior years. The personnel of this division is charged with the task of correlating the preclinical sciences with the preventive aspects of clinical medicine. The work of the division is closely allied to that of the division of medicine; in fact, all members save one teach in both.

One hundred and forty-four hours is devoted to preventive medicine. This time is allocated as follows: In the sophomore year, eighty hours is devoted to the laboratory aspects of preventive medicine and public health. This is given concurrently with the course in medical bacteriology. An additional thirty-two hours is devoted to didactic lectures in the fundamental subjects dealing with man's environment and with the preventive aspects of the communicable diseases. Sixteen hours in the junior year and sixteen hours in the senior year are devoted to didactic lectures on the relationship of man to his environment and on the organization of individual and community health services.

The personnel of the department consists of two full time and two part time instructors, and in addition special lecturers from the clinical divisions of pediatrics, obstetrics and psychiatry; specialists in technical subjects, parasitology, industrial hygiene and sanitary engineering; a public health officer, an officer from the United States Public Health Service, and the director of the State Hygienic Laboratories.

By a close liaison with the division of medicine, especially through the teaching of clinical medicine, the principles of prevention are better taught and integrated with the general curriculum of the school. An attempt is made to correlate the principles of preventive medicine with the clinical subjects and to give the personnel responsible for this an opportunity to work with the other departments of the medical school. The teaching of the subject is didactic in the division of preventive medicine but practical in the clinics, wards and homes of the clinic patients. The laboratory phases of preventive medicine are stressed in the courses on bacteriology, protozoology and tropical medicine. A short laboratory period is planned for the practical problems involved in the recording of vital data. The domiciliary visits offer the students an opportunity to observe the work of the visiting nurse and the medical social service worker and to study the socio-economic problems of disease. Through the periodic health examinations the students have an opportunity to do routine physical examinations on normal young persons. In the clinic for syphilitic cardiovascular diseases the preventive aspect of syphilis is seen as a practical problem. Field trips and sanitary surveys have been discontinued because it is believed that they are wasteful of the students' time, since they more properly come within the domain of public health.

The broadest concept of medicine is possible only where there are no sharp lines of demarcation between the various divisions of the medical school. The objectives of preventive medicine cannot be attained unless the program of this division integrates with the general medical curriculum. Preventive and curative medicine are inseparable. A desirable combination of services is effective only in the hands of the well trained practicing physician.

(To be continued)

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, April 6, page 1401.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: *Basic Science.* May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical* (Regular). Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison. *Medical* (Eclectic). Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, April 17. *Written examination.* San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: Denver, April 2-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, June 8. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

DELAWARE: *Examination.* Dover, July 9-11. *Reciprocity.* Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, April 22-23. *Medical.* Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: *Basic Science.* De Land, May 25. Sec., John F. Conn, De Land. *Medical.* Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, June 23-27. Acting Superintendent of Registration, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 5-7. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: *Medical.* Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, April 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson.

NEBRASKA: *Basic Science.* Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Reciprocity with oral examination.* Carson City, May 6. Sec., Dr. Frederick M. Anderson, 215 North Carson St., Carson City.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 24-27. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

NORTH DAKOTA: Grand Forks, July 2-3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: *Basic Science.* Oklahoma City, May 9. *Medical.* Oklahoma City, June 5-6. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Basic Science.* Corvallis, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: San Antonio, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 11-13. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WISCONSIN: Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

WYOMING: June 3-4. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

Book Notices

Speech Correction: Principles and Methods. By C. Van Riper, Ph.D., Director of the Speech Clinic, Western State Teachers College. Cloth. Price, $2.50. Pp. 434, with 25 illustrations. New York: Prentice-Hall, Inc., 1939.

This book should prove especially helpful to the speech student or the speech correctionist just embarking on his career. It covers the field more comprehensively than almost any other recent book on the subject and does not confuse the reader with too much technical terminology, although now and again the author indulges in the common tendency of the nonmedical man to display the fact that he is fully conversant with medical knowledge and procedures.

The first few chapters are devoted to the anatomy and physiology of the vocal tract and the development of speech. In chapter v the author presents a good discussion of the personality deviations of the speech defective and the necessity for treating the individual as well as his defect. In succeeding chapters he discusses the qualifications of the speech correctionist, case history taking, tests and examination methods. Chapters x to xv inclusive cover the various speech and voice conditions—delayed speech, articulatory disorders, voice disorders, stuttering, cleft palate speech, bilingualism and dialectalism—with suggested therapeutic procedures.

The chapter on articulatory disorders is excellent. It offers the teacher and the speech clinician alike many practical suggestions, methods and technics. The chapter on stuttering summarizes the principal schools of thought on that disorder, but naturally the major portion of it is devoted to a discussion of the theory and procedures which the author advocates. Many workers in the field may disagree with some of his points, especially the significance he attaches to handedness. They may also question the scientific value of his preliminary therapeutic procedure—to make the stutterer precipitate himself into situations which will elicit an increased stuttering response, and to refuse further treatment unless he follows out this injunction. It would seem that this would automatically eliminate the person most in need of assistance—the one whose anxiety neurosis is so pronounced that he finds it impossible to carry out the "assignment." (We of course assume that in reality the author does not peremptorily dismiss the recalcitrant stutterer but makes some further provision for him.)

The prospective speech correctionist may be dismayed by the amount of knowledge and the number of skills the author would have him acquire. In addition to a store of general knowledge, the author would have the speech teacher be able to administer a long list of tests—among them tests for intelligence, achievement, auditory acuity, memory span, laterality and motor coordination—and be able to do laryngoscopic as well as other examinations.

However, these are minor points and the speech correctionist will find the book as a whole a valuable source of reference. It is clearly and lucidly written, with an attractive, readable style, and no other recent work gives such a detailed and systematic survey of the different speech conditions or so many practical suggestions with regard to diagnostic procedures and treatment. The author is also to be commended for his extensive bibliography, which has been carefully compiled in a manner to be most useful to the reader.

Asthma. By Frank Coke, F.R.C.S., with the collaboration of Harry Coke, M.R.C.S., L.R.C.P., Honorary Physician, Charterhouse Rheumatism Clinic, London. Second edition. Cloth. Price, $4. Pp. 266, with 19 illustrations. Baltimore: William Wood & Company, 1939.

The reader who chooses this monograph with the hope that it is a thorough, complete treatise on asthma will be disappointed. Much of the essential material is treated too briefly, anaphylaxis and atopy in eighteen pages, the anatomy and physiology of the lung in another eighteen pages. Some of the material included is either obsolete, for example Vaughan's hypothesis of toxic split protein products as the cause of asthma attacks, or controversial. A typical example of the latter is the unequivocal statement (page 117) "It [the active material in pollen] is a polysaccharide." This is accepted by few authorities. No mention is made regarding the obsolete nature of some of the theories or that other opinions prevail on those questions which are not yet settled. As a result the bibliography is inadequate and limited to only a few papers covering each subject discussed. In discussing the methods of diagnosis, the author fails to emphasize the value of a history and the means for eliciting it. About a fourth of a page is devoted to elimination diet studies. Cutaneous tests are briefly discussed but without mention of their interpretation or the significance of positive and negative reactions. Strangely, the authors warn against ever testing endermally with grass pollens because of the danger of a constitutional reaction. This is not our experience in America. In the discussion of the treatment of the severe paroxysm, many important omissions are noted: no mention of helium in spite of a brief discussion of the value of oxygen; no mention of aminophylline in spite of its importance in patients who fail to respond to epinephrine. One of the most serious omissions, according to opinions of allergists in America, is the absence of warning against the danger from the use of morphine in a severe attack. The author advises without a word of caution the use of one-third grain (0.02 Gm.) of morphine subcutaneously in severe attacks. Finally, the basis for this revision as stated by the authors was to establish a classification for asthma. The suggested division is (1) simple allergic asthma, (2) the microbic type and (3) the mixed type (combining groups 1 and 2). This classification is based on protein precipitation curves obtained by adding orthovanadic acid in a buffer acetate solution to the patient's serum. The description of the technic used, in spite of the importance attached to this part of the book, is inadequate and unclear for any one who would wish to perform or even to understand this test. The amount of acid used, the p_H of the buffer, the amount of serum—all these details are omitted. The reader is referred by the authors to the original work for almost all the necessary data.

A Text-Book of Gynaecology for Students and Practitioners. By James Young, D.S.O., M.D., F.R.C.S.E., Professor of Obstetrics and Gynaecology, University of London, London. Fifth edition. Cloth. Price, $5. Pp. 425, with 226 illustrations. New York: Macmillan Company; London: Adam & Charles Black, 1939.

After reading this book the reviewer felt sad. Dr. James Young is one of the greatest gynecologists in the world but one cannot gather this impression from the fifth edition of his textbook of gynecology. In their advertisement the publishers particularly emphasize the section devoted to the recent advances made in the science of sex endocrinology but the author devotes only twelve pages, including illustrations, to this most important branch of gynecology. In the sections on the various menstrual disturbances there is some additional material on endocrinology, but it is still wholly inadequate even though at the present time endocrine therapy has a limited field of usefulness.

Not all of us agree with Young that the translation of "mittelschmerz" is "half-time pain." Likewise not many American gynecologists are in favor of evacuating ovarian cysts by syringe through the cul-de-sac of Douglas in cases of metropathia haemorrhagica. For the latter condition the author also advocates the use of male hormones 50 mg. twice weekly and continued if necessary for one or two months. The reviewer agrees that in some cases of excessive uterine bleeding of functional origin testosterone propionate will control the bleeding, but it is not advisable to recommend to students and practitioners that they give as much as 800 mg. continuously.

The chapter on leukorrhea is only three pages long. Monilia is not even mentioned although it is not an uncommon source of vaginal discharge and, while Trichomonas is spoken of, the reader is not told how to recognize this organism. A textbook on gynecology should surely point out the importance of making hanging drop examinations, particularly because it is the simplest and, for most general practitioners, the only way to detect Trichomonas vaginalis.

The author devotes a fair amount of space to chronic endometritis. Such a diagnosis was commonly made before Hitschmann and Adler published their monumental study on the endometrial cycle but we now know that chronic endometritis is very uncommon. The author also speaks of senile endometritis (separate from pyometra) which he treats by inserting a drainage tube into the uterine cavity for at least seven days.

In discussing relief of pain in cases of carcinoma of the uterus no mention is made of intraspinal injection of alcohol, although this is a much simpler and more effective procedure than division of the superior hypogastric ganglion. In the section on carcinoma of the cervix, there is no word about the Schiller test or the colposcope.

Most of the illustrations are good but there is a peculiar distribution of them. Two illustrations are reproduced in two different sections and given two sets of figures (vaginal dilator, fig. 48 and fig. 214, and tuberculous disease of the pelvic organs, fig. 81 and fig. 96). In the chapter on vaginal operations only two steps in a vaginal hysterectomy are shown and both of these are reproduced from other authors. There are two illustrations showing a myomectomy and one depicting a myoma screw but only one drawing of a subtotal hysterectomy. This one was borrowed from Kelly and shows the difficult and unusual way of doing a hysterectomy, at least in the United States.

The fact that this book has reached a fifth edition since 1921 indicates its popularity in spite of the foregoing criticisms.

Klinische Behandlung, Arbeitshärte und Hochförderung bei der Tuberkulose: Drei Vorträge über die Aufgabe der Heilstätte und der Hochförderung-Kolonie bei der Wiedereingliederung Tuberkulöser in die Arbeit. Von Dr. W. Bronkhorst, Direktor des Sanatoriums Berg en Bosch und der ADO-Werkstätte Bilthoven (Holland). Nr. 77, Tuberkulose-Bibliothek: Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, Dirigierender Arzt, Sommerfeld. Paper. Price, 5.40 marks. Pp. 44, with 13 illustrations. Leipzig: Johann Ambrosius Barth, 1940.

The problem of returning the tuberculous to industry is as old as the sanatorium itself, but the author brings the subject down to the present in the light of modern perspectives resulting from the rapid development of clinical and sociomedical methods of treatment. Bronkhorst hopes, therefore, that his monograph will aid to awaken new interest in an old problem. Too much stress has been laid on the physical power and too little on the psychic and moral factors. Therefore, gymnastic exercises are not suited to restoration of working power. Only in well organized industrial trades that so far as possible carry a normal character from every point of view can the work cure give its full value. This is to be distinguished from the vocational therapy, the so-called occupational therapy of the Americans. Its aim is "diversion and education through occupation." Occupational therapy also can begin in the phase of clinical treatment when the patient is still bedridden. In the light of an organized, convenient or valuable occupation of the patient during clinical treatment it can be recommended, but it should not be mistaken with the conception of the work cure (arbeitskur). The work cure is basically different from "occupational therapy" even for requiring a possibly favorable clinical and anatomic recovery before the work cure can begin and also because the work cure brings the patient in contact with the conditions of daily life and his regular work.

After considering the changes in type of cases and the results after discharge, Bronkhorst concludes that the dispensary has the function of prophylaxis, early diagnosis and after-care in the individual environment of the ill. The sanatorium serves intensive clinical treatment, work treatment and after-care, which includes all three groups of those requiring work. The tuberculosis divisions of hospitals or tuberculosis hospitals or invalid homes have the problem of hospitalizing the positive invalids. In this sense, when dispensary care, treatment and after-care are organically combined, a successful plan in combating tuberculosis will be followed. Details and hours (dosage) of work treatment are discussed and the basis of work organization considered. In a final chapter (III) the sanatorium Berg en Bosch and the "ADO Werkstätte" are described. Well chosen photographs illustrate some of the industries followed.

This monograph will appeal to all interested in the public health as well as economic aspects of the rehabilitation of the tuberculous and to those interested in and executing the various functions of combating tuberculosis. Although some will consider the book only one man's experience, it is more than that because it records the views evolved from considering a problem and building a plan over many years. This monograph contains valuable information for any one interested in the rehabilitation of the tuberculous from a work and economic point of view. It might even interest the progressive practicing physician who can read German fluently as a classic illustration of one of the intricacies involved in helping solve the tuberculosis problem in man. The monograph is well composed and printed in the well known manner of the *Zeitschrift für Tuberkulose*.

Epidemiology of Tuberculosis. By Godias J. Drolet, Statistician, New York Tuberculosis and Health Association. Chapter 1 [of] Clinical Tuberculosis. Edited by Benjamin Goldberg, M.D., F.A.C.P., F.A.P.H.A. Cloth. Pp. 70, with 27 illustrations. Philadelphia: F. A. Davis Company, 1939.

This small volume measures 7 by 10 inches, is bound in blue buckram and is printed on a good grade of paper. The signature of Godias J. Drolet, statistician, is a guaranty of the quality of the material presented and the excellence of presentation. He acknowledges the assistance given by Miss Whitney, statistician of the National Tuberculosis Association. The author has felt that the summary treatment of such a broad subject would be more useful by reducing theorizing and the expression of opinions and by presenting as succinctly as possible, either in graphic or in tabular form, the latest reliable data in order to furnish the competent reader a definite basis to form correct judgments. He felt also, since this volume is primarily by American authors, that manifestations of tuberculosis, particularly in the United States, could best be presented and would be of more immediate interest. Following a satisfactory historical introduction, Drolet points out that the relative importance of tuberculosis varies with the time and the place and, as is well known, among certain groups on which he dwells. Following this he discusses briefly morbidity and incidence. Consideration is then given to the prevalence of infection—among infants, preschool age, school children, high school and university students and adults, with sex, urbanization, rural conditions, contact, color and race, economic conditions, reduction of incidence and the clinical significance of infection being reviewed. The mortality from tuberculosis is dwelt on from the standpoint of large American cities and by states. The mortality in foreign cities and countries is considered. Forms of tuberculosis with regard to various locations and factors influencing mortality such as sex, age, urbanization, color, occupation, housing and race are given appropriate space. Finally the oft disputed and discussed inheritance and sociologic factors close the chapter on epidemiology, ending with twenty well chosen references. Here are made readily available American statistics on tuberculosis such as one may be called on to give at any time and a sufficient sprinkling of foreign information for comparative purposes. If the remaining chapters adhere to the material quality of data presented by Drolet, the set should find an adequate demand from physicians, health workers, statisticians and scientific libraries for frequent reference.

The Merck Index: An Encyclopedia for the Chemist, Pharmacist, Physician, Dentist and Veterinarian Containing Useful Scientific Data and Other Information on the Physical, Chemical and Medicinal Properties, as well as the Various Uses, of Chemicals and Drugs; Also More Than 4,500 Chemical, Clinico-Chemical Reactions, Tests and Reagents; Formulas for Preparation of Culture Media, Fixatives and Staining Solutions; Useful Tables; Antidotes for Poisons; Literature References. Fifth edition. Fabrikoid. Price, $3. Pp. 1,000. Rahway, N. J.: Merck & Co., Inc., 1940.

Earlier editions are undoubtedly well known to many physicians. Those who are not familiar with it will find that the index is intended to be a practical encyclopedia for the chemist, pharmacist, physician, dentist and veterinarian. Useful information on the chemical and physical properties of some 5,900 substances, listed in many instances by their proprietary names, together with brief statements of their industrial or medicinal uses, comprises 592 pages in the new edition. The present revision appears to be the best of five compilations published since 1889. Many structural formulas illustrate the descriptions of new substances. The scheme of nomenclature employed in the list of chemicals is good, although lapses such as the use of "larocaine" for "larocaine hydrochloride" may be noted. Proprietary names of various substances are abundant in the list, although such names obviously are not exhaustively compended or cross referenced. A number of the newer proprietary pure substances are not mentioned. Such medical information as the volume includes under the various proprietary substances is, in

most instances, similar to that provided by the manufacturers concerned. Substances official in the U. S. Pharmacopeia are so designated.

An interesting addition—one that should be quite useful—is the list by the author's name of 4,510 clinicochemical reactions, tests and reagents. This somewhat cumbersome list is supplemented by a cross list of tests for the various substances concerned.

A condensed description of the coal-tar colors permissible for use in foods, drugs and cosmetics under the new law, a list of indicators with their characteristics, a table of important minerals and their properties, numerous physical and mathematical tables and a list of literature references round out the volume. Merck & Co., Inc., and those who performed the compilation should be congratulated on a tedious job well done.

Der tuberkulös überempfindliche Mensch. Von Dr. med Eduard Schulz, Oberschreiberhau i. Rsgb. (Schlesien). Nr. 75, Tuberkulose-Bibliothek: Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, Dirigierender Arzt, Sommerfeld. Paper. Price, 4 marks. Pp. 85, with 9 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

Tuberculosis may be considered an infectious disease and an allergic disease. The former requires the determination of tubercle bacilli for diagnosis and the tuberculous tissue characterized by tubercle. It is known that tuberculosis begins mostly as a primary complex in the lungs, but there is a form of tuberculosis with no determinable primary complex; no tubercle bacilli can be found, but only inflammatory changes are discernible. "Allergy," as known in tuberculosis since Pirquet and described in detail in pulmonary tuberculosis by Ranke, is not being dealt with by the author. "Allergy" to Pirquet meant a "changed reaction ability" of the body. With added information, this has been extended so that it includes the anaphylactic changes. Now the extended allergy is intended to mean the inclusion of an anaphylaxis—a hyperallergy. We know that the tubercle bacillus not only possesses a very high resistance to all contacting influences but exerts a very slight toxicity to man (Hübschmann). This is the basis for the more marked extent and clinically greater manifestation than occurs in other infectious diseases. Thus not only local changes result but the entire cell state of the human organism takes part in the change—it becomes allergic. In the phthisical patient we are concerned with an outspoken organic disease, while in the allergic tuberculous patient we are concerned primarily with a functional disturbance, in which case subjective symptoms predominate. In the allergic tuberculous patient the objective observations of the individual methods do not always suffice for a diagnosis and at times they may controvert it. The entire picture of hyperallergy becomes a basis for the symptoms. The importance of the anamnesis, the tuberculous focal infection, the tuberculin reaction and the blood picture are elucidated by the author with appropriate case illustrations, photographs and roentgenograms. In a final chapter the author's ideas on the treatment of the allergic tuberculous individual are elucidated with a consideration of tuberculin (as important to the internist for desensitization as the knife is to the surgeon); but no pulmonary focus, especially an active one, must exist. As medicaments, calcium preparations, arsenic-iron and gold preparations are to be considered. Climate in resistant cases and baths and water cures should be considered, especially to prepare for the tuberculin treatment, which must be individualized. The author still contributes to the old Naegeli view of 97 per cent of the population being infected. An ingenious chart illustrates three groups of human beings: (1) those in whom infection results in no disease changes (euergisch), (2) the allergic group and (3) the phthisical—the chronic infectious disease. The campaign against tuberculosis has been considered primarily only for the third group. The first two groups are as good as unexplored in man.

This article is fascinating and worth reading by all interested in the allergic phases of tuberculosis. Many statements may be questioned because of the present unknown nature of certain phases of tuberculosis, but the article presents not only food for thought but food for investigation. Tuberculosis libraries and progressive internists interested in tuberculosis may want a copy for discriminative reading and study. The author considers that in the solution of the allergy problem lies the key to the solution of the tuberculosis problem.

Lane Medical Lectures: Viruses and Virus Diseases. By Thomas M. Rivers, M.D., Sc.D., Director, Hospital of The Rockefeller Institute for Medical Research, New York City. Stanford University Publications, University Series, Medical Sciences, Volume IV, Number 1. Cloth. Price, $2.50. Pp. 133, with 34 illustrations. Stanford University, California: Stanford University Press; London: Oxford University Press, 1939.

This book includes the five Lane medical lectures on viruses and virus diseases given at Stanford University in 1939. The chapters are on lymphocytic choriomeningitis, the pathology of virus diseases, immunologic and serologic phenomena of virus diseases, the nature of viruses and the treatment and prevention of virus diseases.

United Hospital Fund of New York: Sixtieth Year Book 1939. Paper. Pp. 51. New York, 1939.

The annual report of the United Hospital Fund for 1939 contains, as usual, much information concerning the character and extent of hospital service in the New York metropolitan area. Most illuminating, however, are the statistics which indicate the amount of hospital care provided by public and private agencies respectively. Of all persons hospitalized, the voluntary hospitals cared for 62 per cent and the municipal institutions for less than 38 per cent. On the other hand, voluntary hospitals were filled to 74 per cent of their capacity while municipal institutions were vastly overcrowded as indicated by an occupancy of 99 per cent. In New York the private hospitals are reimbursed by the city to some extent for the care of indigent patients but it would seem that there is still room for improvement in the direction of a more even distribution of the load.

Virus and Rickettsial Diseases with Especial Consideration of Their Public Health Significance. A Symposium Held at the Harvard School of Public Health June 12-June 17, 1939. Cloth. Price, $6.50. Pp. 907, with illustrations. Cambridge: Harvard University Press; London: Oxford, 1940.

A symposium on virus and rickettsial diseases was held at the Harvard Medical School in the summer of 1939. The published compilation of that symposium contains contributions from such eminent authorities as Zinsser, Gordon, Russell, C. K. Drinker, McKhann, Aycock and Fothergill. It represents an invaluable contribution to the summarization of present knowledge of viruses and diseases caused by them.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Act: Legislative Regulation of Advertising Upheld.—The defendant, a dentist practicing at Easton, Mass., sent out a letter of advertisement offering his services. On the ground that the letter contained certain words and statements of a character tending to deceive and mislead the public and otherwise offended against the Massachusetts statute regulating advertising by dentists, he was indicted and tried in the superior court, Suffolk County. On conviction, he appealed to the Supreme Judicial Court of Massachusetts, Suffolk, which overruled his appeal.

The statute, said the Supreme Judicial Court, is evidently intended to prohibit advertising of professional service and its incidents. The essence of the statute so far as it relates to the several counts in the indictment, said the court, is (1) that no person practicing dentistry and no dental hygienist shall include in any manner of advertising any written or spoken words or statements of a character tending to deceive or mislead the public or claiming ability to perform painless operations of a dental or oral surgical nature, or tending to solicit patronage, or advertising to use any system of anesthetics without truly and accurately naming it; (2) that no person practicing dentistry and no dental hygienist shall make any promise, guaranty, offer, inducement, representation, statement or reward of a character tending to influence, persuade or induce persons to seek, employ or patronize his business, service, advice or products but (3) that certain acts that would apparently be prohibited by the two prohibitions just stated might under certain conditions be performed.

In short, said the Supreme Judicial Court, the statute purports to deny to a registered dentist, such as the defendant, not merely the use of dishonest or deceptive advertising but also the right to seek patronage through advertising in modes deemed harmless and rightful when employed in commercial business.

The legislature may regulate advertising even in commercial business when the public interest so requires. In the professions the right to restrict advertising is broad and clear, and dentistry is undoubtedly a learned profession. The learned professions, said the court, quoting from *McMurdo* v. *Getter* (Mass.) 10 N. E. 2d, 139, "are characterized by the need of unusual learning, the existence of confidential relations, the adherence to a standard of ethics higher than that of the marketplace, and in a profession like that of medicine by intimate and delicate personal ministration. Traditionally, the learned professions were theology, law and medicine; but some other occupations have climbed, and still others may climb, to the professional plane. *United States* v. *Laws*, 163 U. S. 258, 16 S. Ct. 998, 41 L. Ed. 151. Dentistry, a branch of medicine, has done so within modern times." Continuing, the court said,

> The granting of a license to practice a profession, signifies only attainments warranting entrance into professional life. With some, admission to practice is only the beginning of a lifetime of study, self-improvement, and advance in knowledge and skill. With some others, it marks the end of systematic study and of substantial progress in professional competence. The Commonwealth has an interest in attracting to the learned professions men of ability, capable of adorning them, and in enabling such men to survive in competition with others. It has an interest in spreading as widely as possible among its citizens the benefit of the professional services of the most competent practitioners as distinguished from those who barely possess the minimum qualifications for beginning practice at all. It has an interest in leaving its professional men free to improve their professional qualifications, without the necessity of devoting time and effort to the competitive pursuit of clients or patients. It has an interest, too, in freeing its citizens from the pressure of salesmanship in the formation of confidential professional relations.
>
> The Legislature might find, and apparently did find in the case of dentists, that these public interests would be injuriously affected by free competition among practitioners without restraint as to methods. The Legislature might consider that in general practitioners of high character, deep learning and great skill are more conscious of vast areas of knowledge not yet explored than of the narrow fields in which they may have attained mastery; that they are restrained in speech, and careful that promise never outruns performance; and that as a class they either are incapable of advancing themselves by brazen self-laudation, or scorn resort to that means. The Legislature might conclude from human experience that practitioners of scant competence, like charlatans and demagogues, are likely to make up for want of genuine merit by an expert knowledge of mass psychology and great skill in appealing to the hopes and emotions of the uninformed and credulous. Advertising practitioners, as fast as discovery of their comparative incompetence causes the loss of clients or patients, for a long time can obtain new ones through skilful publicity. It may be that even with complete freedom in advertising, practitioners of unusual competence ultimately would succeed and others ultimately would reach the level of their merits; but in the meantime thousands if not millions of citizens might receive inferior service in the belief, induced by skilful advertising, that it was superior. Under the traditional method of professional advancement through the recommendation of satisfied clients or patients, progress may be slower, but it bears more relation to merit. The Legislature, taking the view which has been expressed, might conclude that the regulations made were necessary for the protection of public interests.

The restriction and even the prohibition of advertising by members of the learned professions constitutes a lawful exercise of the police power, and not, as has been contended, a violation of constitutional provisions protecting liberty and property, or discriminatory legislation.—*Commonwealth v. Brown (Mass.), 20 N. E. (2d) 478.*

Workmen's Compensation Acts: Sympathetic Ophthalmia; Rejected Claim for Compensation Reviewable in New Proceedings.—On Dec. 20, 1932, the claimant in this case was awarded compensation for 100 weeks for the loss of vision in his left eye, which had been injured in the course of his employment. The compensation was paid and on Aug. 16, 1934, the injured workman filed a claim for further compensation, alleging that he had suffered complete loss of vision in his right eye as a result of the injury to his left eye two years earlier.

The department of labor and industry, however, on July 11, 1935, rejected the claim, and no appeal was taken. On Aug. 12, 1936, the claimant filed a new claim in which he alleged that he had been industrially blind in his right eye since July 15, 1935, that his vision had steadily grown worse since that time, and that his earning capacity had diminished since testimony was last taken in the case. The department of labor and industry thereupon awarded the claimant compensation for total disability at the rate of $18 a week, beginning Aug. 7, 1936, and continuing until further order by the department. From the award the employer appealed to the Supreme Court of Michigan.

Though the claimant's right eye was not directly injured in March 1932, said the Supreme Court, there was testimony that its condition at the time of the award was due to transferred or sympathetic ophthalmia caused by the injury to the left eye, that the claimant was totally blind in his left eye and had only 1/200 of normal vision in his right eye, and that he was industrially blind. The employer claimed, however, that since the order of the department of July 11, 1935, had not been appealed from by the claimant the case was closed and the claimant had no right to renew his claim. But this doctrine, the doctrine of res judicata, said the Supreme Court, is limited in its operation when sought to be applied to a man's physical condition which constantly changes and under a statute which provides that weekly payments may be reviewed and ended, diminished or increased as the facts warrant. The department, it was true, had found by its order of July 11, 1935, that the plaintiff had not been proved to be blind in his right eye or to be totally disabled, but in the present proceedings the department found that he was industrially blind and totally disabled, and those findings were warranted by the facts. The order of the department of July 11, 1935, did not prevent the claimant from showing the facts.

While proceedings were in progress the claimant died. The Supreme Court, however, held that the liability of the employer did not terminate with the claimant's death but that the amounts which had accrued to the claimant during his lifetime might be collected by his personal representative. The Supreme Court affirmed the award of the department to that extent.—*Houg. v. Ford Motor Co. (Mich.), 285 N. W. 27.*

Evidence: Admissibility of Statements Made by Examinee to Examining Physician.—The plaintiff claimed that while she was shopping in the defendant's place of business she was struck a glancing blow on her head and shoulder by a large rug that accidentally toppled over and that as a result she suffered from traumatic neurosis. In support of her claim she offered the testimony of a physician as an expert witness. This physician had never treated her, but almost a year after the alleged injury and about a week or ten days before the trial he had examined her. In the course of the examination the plaintiff told him in detail of her condition before the alleged injury, of the manner in which she was injured and of her condition since the injury. All this the witness was allowed to give in evidence, over the defendant's objection. He testified, too, that the plaintiff seemed to him to suffer pain in the course of the examination. In answering two hypothetic questions the witness assumed that what the plaintiff had told him concerning her condition and the cause of the injury was true, and he concluded that she was suffering from "neurosis" precipitated by the accident that the plaintiff had described. In the district court, Lee County, verdict was given for the plaintiff and judgment rendered on it. The defendant then appealed to the Supreme Court of Iowa.

As a general rule, said the Supreme Court, the law excludes all evidence of mere hearsay declarations made to a witness who is sworn and examined. This is because such declarations are not made under oath and the person making them has not been subjected to cross-examination. An exception to this rule has been recognized in favor of the testimony of a physician who repeats statements of a patient concerning the history of his ailment when those statements have been made in the course of treatment. The courts sense a probability that the patient will not falsify statements made to his physician in the expectation and hope of receiving from him medical aid and benefit. No such presumption can be indulged in, however, and according to the great weight of authority such testimony is not admissible when the patient, having become a litigant, causes himself to be examined for the purpose of qualifying the examining physician to give evidence in a case about to be tried. If testimony could be introduced in that way, an opening would be made for putting before the jury any quantity of self-serving *ex parte* statements.

No well considered authority, said the Supreme Court, had been called to its attention that would sustain the trial court in

overruling the objections of the defendant to the admission of the evidence complained of. The testimony was hearsay and self serving and not within the exception of the rule. The trial court erred, too, in overruling the defendant's objections to the hypothetic questions, based as they were, in part at least, on incompetent testimony. These errors were prejudicial and the judgment of the trial court was therefore reversed.—*Mitchell v. Montgomery Ward & Company (Iowa), 285 N. W. 187.*

Hospitals, Charitable: Liability to Pay Patient When Profit Results from Operation of Hospital.—The defendant was a hospital organized not for profit. The plaintiff was admitted to the institution as a pay patient and sustained a third degree burn when a nurse placed a hot water bottle against his leg. He sued the hospital and from an adverse judgment he appealed to the district court of appeal of California, where the judgment for the hospital was reversed and the case remanded for a new trial because, for other reasons, the trial court had erred in refusing to submit to the jury the issue of the plaintiff's claim that the hospital was in fact conducted for profit. *England* v. *Hospital of Good Samaritan*, 16 Cal. App. (2d) 640, 61 P. (2d) 48 (abstr. J. A. M. A. 108:2253 [June 26] 1937). The case was retried and judgment again rendered for the hospital. On appeal, the district court of appeal held that the trial court had erred in refusing to instruct the jury as follows:

> You are instructed that the defense of nonliability because of its charitable character is unavailable to defendant, if you find from the evidence that plantiff had no knowledge or belief that defendant claimed to be or was a charitable institution, and further provided you find that plaintiff paid its regular rates to defendant from which it derived a profit.

—*England* v. *Hospital of Good Samaritan*, 22 Cal. App. (2d) 226, 70 P. (2d) 692.

The case was tried a third time, resulting in a judgment for the plaintiff, and again the district court of appeal was required to pass on the issues involved.

The findings of the trial court in this third trial of the case, said the district court of appeal, were sufficient to sustain the judgment against the hospital. It was found that the hospital earned a net profit of $62,767 for its operation during the year that the plaintiff applied for admission to the hospital and was received as a patient paying the minimum rate of $25 a week; that at the time the plaintiff applied for admission to the hospital he had no knowledge of its alleged charitable character; that the plaintiff had no knowledge at any time that defendant claimed to be free from liability for negligence on the part of its employees by reason of its alleged charitable character, and that the plaintiff paid the usual and customary rates required and that no charity was requested by nor extended to him. In view of these findings, taken into consideration with the law applicable to the situation as set forth in the instruction already quoted, the district court of appeal affirmed the judgment against the hospital. On appeal, the Supreme Court of California affirmed the judgment of the district court of appeal.—*England v. Hospital of the Good Samaritan (Calif.), 88 P. (2d) 727; 97 P. (2d) 813.*

Society Proceedings

COMING MEETINGS

American Medical Association, New York, June 10-14. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
Alabama, Medical Association of the State of, Birmingham, Apr. 16-18. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
American Association for the Surgery of Trauma, Atlantic City, N. J., June 7-8. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.
American Association for Thoracic Surgery, Cleveland, June 6-8. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.
American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.
American Association on Mental Deficiency, Atlantic City, May 22-26. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
American Broncho-Esophagological Association, New York, June 5. Dr. Paul Holinger, 1150 N. State St., Chicago, Secretary.
American College of Chest Physicians, New York, June 8-10. Dr. Robert B. Homan Jr., P. O. Box 1069, El Paso, Texas, Secretary.
American Heart Association, New York, June 7-8. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.
American Laryngological Association, Rye, N. Y., May 27-29. Dr. C. J. Imperatori, 108 East 38th St., New York, Secretary.
American Laryngological, Rhinological and Otological Society, New York, June 6-8. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
American Neurological Association, Rye, N. Y., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
American Ophthalmological Society, Hot Springs, Va., June 3-5. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.
American Orthopedic Association, Kansas City, Mo., May 6-9. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn. Secretary.
American Otological Society, Rye, N. Y., May 30-31. Dr. Isidore Friesner, 36 East 73d St., New York, Secretary Pro-Tem.
American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.
American Psychiatric Association, Cincinnati, May 20-24. Dr. Arthur H. Ruggles, 305 Blackstone Blvd., Providence, R. I., Secretary.
American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
American Society of Clinical Pathologists, New York, June 6-10. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.
American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.
American Therapeutic Society, New York, June 7-8. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.
Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie R. Kober, 15 East Monroe St., Phoenix, Secretary.
Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
California Medical Association, Coronado, May 6-9. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.
Connecticut State Medical Society, Hartford, May 22-23. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
Illinois State Medical Society, Peoria, May 21-23. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.
Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
Kansas Medical Society, Wichita, May 13-16. Mr. Clarence G. Munns, 112 West Sixth St., Topeka, Executive Secretary.
Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-24. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.
Massachusetts Medical Society, Boston, May 21-22. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.
Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. B. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
Mississippi State Medical Association, Jackson, May 14-16. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
Missouri State Medical Association, Joplin, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 634 North Grand Blvd., St. Louis, Executive Secretary.
National Gastroenterological Association, New York, June 4-6. Dr. G. Randolph Manning, Room 319, 1819 Broadway, New York, Secretary.
National Tuberculosis Association, Cleveland, June 3-6. Dr. Charles J. Hatfield, 50 West 50th St., New York, Secretary.
Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. R. B. Adams, 416 Federal Securities Building, Lincoln, Secretary.
New Hampshire Medical Society, Manchester, May 14-15. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, June 4-6. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.
New Mexico Medical Society, Albuquerque, May 27-29. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.
New York, Medical Society of the State of, New York, May 6-9. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
New York State Association of Public Health Laboratories, Rochester, May 20. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
North Carolina, Medical Society of the State of, Pinehurst, May 13-15. Dr. T. W. M. Long, 321 Hamilton St., Roanoke Rapids, Secretary.
North Dakota State Medical Association, Minot, May 6-8. Dr. Albert W. Skelsey, 20½ North Broadway, Fargo, Secretary.
Ohio State Medical Association, Cincinnati, May 14-16. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.
Oklahoma State Medical Association, Tulsa, May 6-8. Dr. L. S. Willour, 210 Plaza Court Bldg., Oklahoma City, Secretary.
Rhode Island Medical Society, Providence, June 5-6. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
Society of Surgeons of New Jersey, Paterson, May 22. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
South Carolina Medical Association, Charleston, Apr. 30-May 2. Dr. E. A. Hines, Seneca, Secretary.
South Dakota State Medical Association, Watertown, May 20-22. Dr. Clarence E. Sherwood, Madison, Secretary.
Texas, State Medical Association of, Dallas, May 13-16. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

199: 157-304 (Feb.) 1940

Effects of Sulfanilamide, Neoprontosil and Sulfapyridine on Erythrocyte Count of White Rats. T. E. Machella and G. M. Higgins, Rochester, Minn.—p. 157.

Nutritional Microcytic Hypochromic Anemia in Dogs Cured with Crystalline Factor I. P. J. Foots, O. M. Helmer and S. Lepkovsky, Indianapolis.—p. 163.

Pernicious Anemia Family: Five Authenticated Cases in Same Generation. F. R. Schemm, Great Falls, Mont.—p. 167.

Some Observations on Case of Hereditary Hemolytic Jaundice. T. R. Waugh and H. Lamontagne, Montreal.—p. 172.

Potency of Blood Coagulating Substances: Biologic Assay. P. M. Agreler and S. P. Lucia, with technical assistance of L. Tyson, San Francisco.—p. 181.

Traumatic Complications in Peripheral Vascular Disease. H. C. Oard, C. R. Campbell and F. N. Dealy, Jamaica, N. Y.—p. 194.

Electrocardiographic Studies in Metrazol Shock Therapy: Report of Electrocardiographic Findings Obtained in Treatment of Fifty Schizophrenic Patients with Convulsive Shock Induced by Metrazol. H. Levine, Secaucus, N. J.; G. F. Piltz, Jersey City, N. J., and L. Rernikoff, New York.—p. 201.

Chloroform Liver Injury Increases as Protein Stores Decrease: Studies in Nitrogen Metabolism in These Dogs. L. L. Miller and G. H. Whipple, Rochester, N. Y.—p. 204.

Azaphenamine Liver Injury Modified by Diet: Protein and Carbohydrate Protective, But Fat Injurious. W. J. Messinger and W. B. Hawkins, Rochester, N. Y.—p. 216.

Use of Vaporized Bronchodilator Solutions in Asthma and Emphysema: Continuous Inhalation Method for Severe Asthmatic States. D. W. Richards Jr., A. L. Barach and H. A. Cromwell, New York.—p. 225.

Quantitative Relationship Between Chloride and Sodium Excretion in Urine. F. Mainer, Alexandria, Egypt.—p. 232.

*Danger of Forcing Fluids in Malnutrition. J. A. Evans and H. Shulman, La Crosse, Wis.—p. 237.

Seasonal Variation in Water Content of Respiratory Tract. E. M. Boyd and G. M. Johnston, Kingston, Ont.—p. 246.

Disease and the Negro: Thyroid Involvements. G. Walsh and R. M. Pool, Fairfield, Ala.—p. 255.

Psychiatric Consultation Service in Medical Inpatient Department: Its Function in Diagnosis, Treatment and Teaching. H. S. Ripley, New York.—p. 261.

*Initial Nervous Syndrome of Pellagra and Associated Deficiency Diseases. J. P. Frostig, Berkeley, Calif., and T. D. Spies, Cincinnati.—p. 268.

Absence of Reactions Following Therapeutic Doses of Nicotinic Acid Amide. H. Field Jr. and W. D. Robinson, Ann Arbor, Mich.—p. 275.

Danger of Forcing Fluids in Malnutrition.—Evans and Shulman point out that a combination of malnutrition with unsuspected hypoproteinemia and a dry tongue may seem a prime indication for administering large amounts of dextrose in saline solution. As the result of specific protein starvation, hypoproteinemia may be present even in the obese patient. The edema in a case reported by the authors disappeared on transfusions of blood, and in another case it disappeared when 5 per cent dextrose in saline solution was substituted for 5 per cent dextrose in distilled water. The authors conclude that too much salt and water intravenously in cases of malnutrition precipitates an edema already potential by reason of the lowered osmotic pressure of hypoproteinemia. Hydremic plethora with its increased intracapillary pressure further conditions the organism for the precipitation of acute pulmonary edema.

Pellagra and Associated Deficiency Diseases.—Evidence accumulated from the study of more than a thousand pellagrins in the past ten years has convinced Frostig and Spies that psychoneurotic symptoms possess certain distinctive characteristics which may be utilized in making an early diagnosis of the disease. These symptoms improve dramatically following nicotinic acid therapy. A satisfactory study of their characteristics has not been reported since the initiation of this therapy. The authors made a special study of the initial nervous symptoms in sixty cases of subclinical and mild pellagra often associated with beriberi and riboflavin deficiency. The investigation was restricted to an analysis of the symptoms and experiences reported by the patients. There was an amazing uniformity of mental symptoms which varied in intensity and had no connection with the personality of the patient. These symptoms were classified into psychosensory, psychomotor and emotional disturbances, and into general symptoms of the central nervous system, such as weakness, increased fatigability, sleeplessness and headaches. The first group of symptoms resembles those which may be found in disease of the basal ganglions and the thalamus, while the second group represents general symptoms which usually accompany any disturbance of the central nervous system. Sleeplessness and headaches of pellagrins exhibit some special features which are uncommon and are therefore useful in making a differential diagnosis. In many cases, sleeplessness was a major symptom. Patients usually fell asleep between 12 and 2 o'clock at night and awakened at about 5 in the morning. Frequently even this short period of sleep was interrupted. The patients stated that their sensory disturbances did not prevent them from falling asleep or cause them to awaken, thus further differentiating this nervous syndrome from the usual one of psychoneurosis. In spite of the constant apprehensive attitude, no bad dreams or nightmares were reported. Many patients report having had "sick headaches" since childhood. The headaches resembled migrainous syndromes in many features. They usually occur suddenly. They are localized in the forehead and temples and are accompanied by scintillating scotomas. Nausea and vomiting were reported frequently and sometimes relief followed vomiting. Many patients had dizzy spells along with the headaches. The headache is clinically indistinguishable from migraine. To determine the effect of certain of the nutritional substances, pellagrins were given large amounts of either cocarboxylase, nicotinic acid, riboflavin or synthetic vitamin B_1. The intravenous injection of cocarboxylase or vitamin B_1 produced an immediate reversal of the neurologic signs within a few hours, while nicotinic acid, administered orally, produced a similar effect after a longer time. The oral administration of riboflavin had no such effect on the symptoms arising from the nervous system. The investigation indicates that nutritional deficiencies may cause a disintegration of the personality, including a breakdown of morale.

Annals of Surgery, Philadelphia

111: 161-336 (Feb.) 1940

*Considerations in Use of Ultraviolet Radiation in Operating Rooms. C. J. Kraissl, J. G. Cinisotti and F. L. Meleney, New York.—p. 161.

Miller-Abbott Tube as Adjunct to Surgery of Small Intestinal Obstructions. O. C. Leigh Jr., J. A. Nelson and P. C. Swenson, New York.—p. 186.

Acute Appendicitis: Twenty Year Clinical Survey. L. J. Morse, Richmond Hill, N. Y., and M. J. Rader, Brooklyn.—p. 213.

Studies of Liver Function by Means of Quick's Hippuric Acid Test. J. G. Probstein and S. Londe, St. Louis.—p. 230.

Studies on Cause of Death in Tetanus. W. M. Firor, A. Lamont and H. B. Shumacker Jr., Baltimore.—p. 246.

Thyroid Disease in Nonendemic Area: Third Series of Observations. U. Maes and S. A. Romano, New Orleans.—p. 275.

*Autogenous Transplantation of Fibrosarcoma of Skin During Application of Full Thickness Skin Graft. G. T. Harrell, Durham, N. C., and A. deT. Valk, Winston-Salem, N. C.—p. 285.

Blood Borne Pyogenic Infections of Bones and Joints. F. Beckman and J. E. Sullivan, New York.—p. 292.

Treatment of Fractures of Neck of Femur by Internal Fixation. J. O. Rankin, Wheeling, W. Va.—p. 315.

Ultraviolet Radiation in Operating Rooms.—After four years of experimental and clinical experience with ultraviolet radiation in the operative field, Kraissl and his colleagues state that the unsterile air in the operating room is an important source of wound contamination. This contamination may be practically eliminated by the use of ultraviolet radiation, in the proper spectrum, with an intensity that will not injure tissue, a point according to them not sufficiently emphasized. An ultraviolet generator applied to an illuminating unit concentrates this radiation in the most critical area, automatically controls the intensity of radiation and, when bacterial concentration is greatest, produces the maximal effect. Surgeons are cautioned to determine that the quality of the radiation is in the most efficient part of the spectrum and that the intensity is great enough to render the air relatively sterile and yet not so great that it will injure tissues for the period during which they will be exposed to the radiation. Auxiliary units should be placed on the walls of the operating room in such a way

that sufficient intensity is developed in the entire room to keep the air relatively sterile. Each unit consists of a 30 inch generator with a control to regulate its intensity, and with the use of a radiometer it is possible to determine accurately the radiation in any part of the room and to raise it or lower it according to the requirements. With the radiometer clicking thirteen times per minute for thirty minutes, under the conditions of the aforementioned installation, the authors felt that air borne organisms were controlled and the viscera not injured.

Autogenous Transplantation of Fibrosarcoma.—Harrell and Valk report an accidental autogenous transplantation of a cutaneous fibrosarcoma which developed in the scar of an old injury, following repeated traumas and infections resulting in recurrent ulcerations. The transfer from the right heel (diseased site) to the left thigh (donor site) was effected during the application of a full thickness pedicle skin graft either by direct extension through the graft or by accidental contamination of the incision at the donor site. It is possible that by some unnoticed break in technic tumor cells were carried, perhaps by the knife, from the malignant growth on the heel to the incision on the left thigh at the time that the skin graft was raised and applied to the heel. Contamination by direct contact is unlikely, for the two incisions were carefully isolated by dressings. In either event the transplant appeared at the site which was left intact for the preservation of blood supply to the graft. It would seem unlikely that cells were transferred later when the pedicle was excised, for the knife was used only on the "clean" area of the thigh and no sutures were taken. The short time (eight days) during which the graft was in contact with both areas would have necessitated a rapid rate of growth for the tumor to pass by direct extension through either the lymphatics or the blood vessels of the graft. However, rapid growth was observed. Microscopically, a diagnosis of fibrosarcoma was made from a biopsy of the heel. Two and a half months after the skin grafting the right leg was amputated 10 cm. below the knee. The amputation wound healed promptly and the patient was discharged in two weeks. Shortly after discharge, the point on the left thigh at which the pedicle to the skin graft had been excised showed signs of infection, although no open wound had been present for three months. A circumscribed ulcer 3 cm. in diameter developed, similar in appearance to the previous one on the right heel. The ulcer together with the deep fascia overlying the muscle was excised. Microscopically the tissue was identical with that from the right heel, except for more anaplasia and increased numbers of mitoses. Nine months after this excision there has been no sign of recurrence at either site, and the patient is up and about, using an artificial limb satisfactorily.

Archives of Otolaryngology, Chicago

31: 231-390 (Feb.) 1940

Petrous Pyramid of Temporal Bone: Pneumatization and Roentgenologic Appearance. J. R. Lindsay, Chicago.—p. 231.
Edema of Larynx: Study of Loose Areolar Tissues of Larynx. M. V. Miller, Philadelphia.—p. 256.
*Of What Value Is Roentgen Therapy for Sinusitis? Rhinologic Study of Twenty-Two Cases. E. T. Gatewood, Richmond, Va.—p. 275.
Use of Expanding Esophagoscope for Extraction of Foreign Bodies. E. I. Matis, Kaunas, Lithuania.—p. 283.
Osseous Lesions of Nose and Sinuses, with Special Reference to Hypertrophic Changes and Tumor Formations. A. T. Smith, Philadelphia.—p. 289.
Vascular Fibroma of Nasopharynx (Nasopharyngeal Fibroma). S. A. Friedberg, Chicago.—p. 313.
Infection with Aspergillus Niger: Report of Two Cases. L. Felderman, Philadelphia.—p. 327.
Functional Examination of Hearing. A. Lewy and N. Leshin, Chicago.—p. 344.

Roentgen Therapy for Sinusitis.—A check up on twenty-two cases of chronic sinusitis observed before and after roentgen therapy caused Gatewood to question whether the results generally reported in the literature by roentgenologists are not more apparent than real. Examinations consisted of the taking of histories, clinical inspection, investigation by shrinkage, suction and lavage, and comparison of films taken before and after treatments. There was no definite evidence of uniform improvement of the infection following roentgen therapy in spite of x-ray changes. With the exception of a single case, microscopic examination of the polypoid content of eight antrums which had been subjected to roentgen therapy did not show any obvious difference from similar pathologic contents of other antrums which had not received like treatment. Closer cooperation between the roentgenologist, the rhinologist and the microscopist must be obtained before determining the true effects of this therapy. It is essential that the rhinologist make the final examination in order to avoid erroneous conclusions.

Archives of Pathology, Chicago

29: 153-302 (Feb.) 1940

Induction of Gastric Tumors in Strain A Mice by Methylcholanthrene. H. L. Stewart, Bethesda, Md.—p. 153.
Studies on Resistance to Transmissible Leukemia in Mice by Means of Parabiosis. O. B. Furth, W. A. Barnes and A. B. Brower, New York.—p. 163.
Reaction of Mouse Skin to Various Reduced and Partially Oxidized Sulfur Compounds. S. P. Reimann and G. Toennies, Philadelphia.—p. 175.
Effect of dl-Methionine and l-Cystrine on Cleavage Rate of Mammalian Eggs. B. J. Miller and S. P. Reimann, Philadelphia.—p. 181.
*Morphologic Appearances of Spirochetal Reproduction in Tissues. G. Steiner, Detroit.—p. 189.
Relation of Elastic Tissue in Root of Aorta to Aortic Valve: Involvement of This Tissue in Syphilis. S. L. Wilens, New York.—p. 200.
*Myasthenia Gravis and Thymus Gland. H. G. Miller, Baltimore.—p. 212.
Additional Observations on Positive and Negative Chemotaxis: Experiments with Myxomycete. D. R. Coman, Philadelphia.—p. 220.
Induced Pulmonary Tumors in Mice: I. Susceptibility of Seven Strains of Mice to Action of Intravenously Injected Methylcholanthrene. M. B. Shimkin, Bethesda, Md.—p. 229.
Id.: II. Reaction of Lungs of Strain A Mice to Carcinogenic Hydrocarbons. M. B. Shimkin, Bethesda, Md.—p. 239.
Pericardial Milk Spots. A. A. Nelson, Washington, D. C.—p. 256.

Morphology of Spirochetal Reproduction in Tissues.—Steiner studied the morphologic appearances in the tissues which result when the local reproduction of spirochetes is initiated. His material consisted of organs from three cases of congenital syphilis, fifty-eight cases of dementia paralytica, among which were three examples of early acute untreated stages of the disease, and the kidneys and other organs of ten rats naturally infected with Leptospira icterohaemorrhagiae. The organs (liver, kidney, adrenal, lung and others) from the cases of congenital syphilis contained enormous numbers of spirochetes. The method of division of the individual spirochete could not be made out in the fixed tissues. However, the numerous spirochetes seen in the organs must have been the result of rather rapid spirochetal reproduction. The organisms are diffusely scattered or accumulated in dense ball-like masses. Morphologically these ball-like masses are round or oval accumulations, made up of spirochetes closely packed together, leaving no space for tissue elements. In these large silver stained spirochetal masses the central and inner parts have a light yellow or brownish color, while the outer zone is black. Under the low power these peripheral spirochetal coils tend to form a stellate pattern. At the periphery the spirochetes are arranged in raylike strands, the axes of which radiate from the center of the ball. The raylike strands are made up of well defined black spirochetes. The central part of the mass is seen to be formed by fine, lightly stained spirochetal threads that are infinitely tangled. Such spirochetal conglomerations were seen in the liver, adrenals, hypophysis, intestinal walls and other organs from the cases of congenital syphilis. In all of the cases of dementia paralytica conglomerations of spirochetes were also seen. The author believes that such conglomerations represent centers of spirochetal reproduction. In dementia paralytica the difference in the size and shape of the spirochetal colonies indicates various evolutionary stages of spirochetal reproduction. Areas of miliary necrosis in congenital syphilis and dementia paralytica are interpreted as the immediate consequence of these reproductive spirochetal conglomerations. This peculiar conglomerative type of reproduction of spirochetes is explained by the following factors. 1. It may be assumed that the reproductive activity of single spirochetes is rapid and that their motility in the tissues is relatively slow. 2. The tissue resistance may in some way prevent the natural movement of spirochetes, for in fluid mediums massive conglomerations are not seen. 3. Some material of gluelike character may be produced by the spirochetes in earlier periods of growth or by the tissues themselves, holding the spirochetes together. The lighter color of the inner parts of the conglomerations could be explained in the same manner. However, if parts of these inner centers are removed and stained for spirochetes, the organisms appear black; con-

sequently the presence of a gluelike material seems improbable. 4. The difference in argyrophilic affinity between the central and the peripheral parts of spirochetal conglomerations may be explained by a difference in density of the spirochetal mass. That the compact inner part may not take the silver salt solution as well as the outer zones explains the difference in color but not the specific type of growth. At present no explanation for this specific conglomerative type of reproduction can be offered.

Myasthenia Gravis and Thymus Gland.—The pathologic observations in five cases of myasthenia gravis encountered among 16,300 necropsies at the Johns Hopkins Hospital are summarized by Miller, who gives only the positive evidence of its relation to the thymus gland. Two of the cases showed an encapsulated tumor of the thymus with remnants of normal thymus outside the capsule, two showed a persistent thymus with well marked peripheral epithelial hyperplasia in one, and in one case the thymus was not identified. This brings the number of reported necropsies in such cases to eighty-seven, in forty-one of which lesions of the thymus were a prominent anatomic feature. In the present five cases abnormalities in the thymus were more common pathologically (four cases) than the characteristic lymphorrhages, which are the accepted criteria of a pathologic diagnosis of the disease. Little can be added to the role assumed by the thymus in the disease. It is suggested that patients with myasthenia gravis be submitted to a thorough x-ray examination and that irradiation and surgical removal of the thymus be carried out more often in the treatment of this disease, which has such an unfavorable prognosis.

Connecticut State Medical Journal, Hartford

41: 59-122 (Feb.) 1940

The Revised Nurse Practice Act. Agnes K. Ohlson, Hartford.—p. 63.
Congenital Arteriovenous Fistulas: Reports of Two Cases. B. B. Landry, Hartford.—p. 64.
Problems of Obstetric Practice in Rural Areas of the United States. E. F. Daily, Washington, D. C.—p. 69.
Therapeutic Aids in Otolaryngology. F. N. Sperry, New Haven.—p. 74.
*Crystalline Zinc Insulin with Protamine: Preliminary Note on Newer Insulin Modification. B. Greenhouse, New Haven.—p. 78.
Vitamin Deficiencies, with Special Reference to Those Involving the Nervous System. E. F. Gildea, New Haven.—p. 83.
Controlled Physically Induced Fever: Safe and Valuable Addition to Therapeutics. W. B. Snow, New York.—p. 88.
Occupational Dermatoses from the Point of View of the General Practitioner. J. G. Downing, Boston.—p. 96.

Crystalline Zinc Insulin with Protamine.—Greenhouse describes "crystalline zinc insulin with protamine," being a modified protamine zinc insulin in which the protamine is combined with a solution of zinc insulin crystals as a base instead of the amorphous insulin with zinc as in the commercial protamine zinc insulin. The modified preparation is clinically identical with the commercial product both in appearance and in effect but is superior to it in that it is less allergic. Because of its purity, crystalline insulin has been indicated for those cases in which areas of lipodystrophy develop at the site of injection of regular or protamine zinc insulin.

Illinois Medical Journal, Chicago

77: 97-192 (Feb.) 1940

The National Health Act. E. R. Burke, Omaha.—p. 127.
Operative Fixation of Fracture of Neck of Femur. W. J. Potts, Oak Park.—p. 133.
Endocrines in Relation to Growth in Childhood. I. A. Alt, Chicago.—p. 137.
Treatment of Postencephalitis, Especially Oculogyric Crises. H. I. Weiner, Dixon.—p. 141.
Rare Fracture: Rare Cause: Case Report. V. R. Vanstane, Chicago.—p. 151.
Subphrenic Abscess. M. H. Judd, Littleton, Colo., and T. R. Hudson, Hines.—p. 155.
Treatment of Head Injuries. A. Bamberger, Chicago.—p. 159.
Endocrines and the General Practitioner. G. B. Lake, Waukegan.—p. 162.
Ophthalmologic Aspect of Disturbances of Endocrine System. E. Selinger, Chicago.—p. 167.
Roentgenologic Manifestation of Endocrine Dysfunctions. C. Gianturco, Urbana.—p. 171.
X-Ray Therapy as Applied to More Common Forms of Disturbances of Endocrine Glands. F. Flinn, Decatur.—p. 173.
Eyeground in Hypertensive and Renal Disease. Bertha A. Klien, Chicago.—p. 177.
Use of Progestin in Obstetric Complications. F. H. Falls, Chicago.—p. 180.

Journal of Urology, Baltimore

43: 249-426 (Feb.) 1940

Multiple Adenomas of Kidneys: Report of Case. W. C. Corwin, Philadelphia.—p. 249.
Evaluation of Roentgenography of Surgically Exposed Kidney in Treatment of Renal Calculi. G. D. Oppenheimer, New York.—p. 253.
Lichen Planus in Bladder: Report of Case. E. L. Young, Boston.—p. 265.
Pedunculated Neurofibroma of Bladder. E. R. Mintz, Boston.—p. 268.
*Total Perineal Prostatectomy. O. S. Lowsley, New York.—p. 275.
*Influence of Testosterone Propionate on Benign Prostatic Hypertrophy and Spermatogenesis: Clinical and Pathologic Study in the Human. N. J. Heckel, Chicago.—p. 286.
Carcinoma of Scrotum. R. C. Graves and S. Flo, Walpole, Mass.—p. 309.
Infarct of Testicle. J. G. Menville, New Orleans.—p. 333.
Calcium Citrate Uroliths on Low Phosphorus Diet. H. Schneider and H. Steenbock, Madison, Wis.—p. 339.
Electrocystometrogram: Report of New Instrument. H. E. Landes and H. C. Voris, Chicago.—p. 345.
Pharmacodynamic Study of Normal Urinary Tract in Children. M. F. Campbell, with technical assistance of Martha Grassmann, New York.—p. 356.
The Duffy Trocoscope. J. J. Duffy, Los Angeles.—p. 409.
Neoarsphenamine in Treatment of Urinary Infections. H. A. Buchtel and E. N. Cook, Rochester, Minn.—p. 417.

Total Perineal Prostatectomy.—Lowsley believes that the value of total perineal prostatectomy has been overlooked by urologic surgeons. He outlines a modification of Young's perineal prostatectomy which offers a slight improvement in the rapidity of healing and also reduces the possibility of incontinence to a minimum. It is suggested that the membranous urethra be joined to the bladder with a mattress suture of ribbon gut; this not only makes the urethra continuous with the bladder but plicates the external sphincter and prevents incontinence. Total or subtotal prostatectomy has been done almost exclusively in early cases of cancer. However, the procedure lends itself to certain other pathologic lesions of the prostate. An early malignant growth of the prostate is particularly suitable for radical perineal prostatoseminal vesiculectomy. Chronic pyemia of the prostate is another pathologic condition which is suitable for total prostatectomy. The prostate occasionally becomes so infected that no amount of palliative treatment will effect a cure. In such cases total prostatectomy is indicated. Transurethral resection of the gland is unsatisfactory. Chronic fibrosis produces symptoms out of all proportion to the gravity of the lesion present. No amount of palliative treatment seems to be effectual, so that total removal of the prostate is a quick and effective method of curing the condition. Chronic tuberculosis of the prostate is often accompanied by calcium deposits. When such a condition exists, total prostatectomy is indicated. In acute or subacute tuberculosis of the prostate, operation is distinctly contraindicated. In certain cases of adenomatous hypertrophy of the prostate and prostatic calculosis, total prostatectomy should be performed. The author performed total and subtotal prostatectomy in forty-three cases. Four (9.3 per cent) patients died in the hospital. All the deaths occurred in cases of carcinoma. The average span of life following subtotal prostatectomy for relief of obstruction to urination due to cancer of the prostate in the author's series is approximately two and one half years. One patient lived more than six years and another five and one half years. Both of these men were free from urinary distress, but the disease was widespread when they died.

Testosterone Propionate for Prostatic Hypertrophy and Spermatogenesis.—Heckel studied the effect of testosterone propionate on the proved benign prostatic hypertrophy and spermatogenesis of twenty-two unselected patients. The testosterone propionate was given intramuscularly to most of the patients in daily injections of from 5 to 30 mg. Nine patients were hospitalized and studied independently by the urologic staff before a transurethral resection was done and thirteen patients were not operated on following injections of the substance. The average age of the nine patients was 72.22 years and of the others 70.23 years. The entire group was treated from four to fifty-six weeks. The results following treatment showed no marked improvement in the symptoms or clinical course. The benefits that did occur were mild and were no greater than the improvement commonly seen when the patient is prescribed soda and sitz baths. There was no

noticeable reduction in the residual urine. Testosterone propionate produced a temporary depletion of spermatozoa in patients who had spermatozoa counts within normal limits. In ten of twelve patients an oligospermia was produced.

Military Surgeon, Washington, D. C.

86: 97-224 (Feb.) 1940. Partial Index

Mobile Treatment Unit in Control of Syphilis. R. A. Vonderlehr.—p. 97.
*A New Finding in Blood of Influenza. H. H. Parsons.—p. 101.
Roentgen Therapy in Gas Gangrene: Experience at Station Hospital, Eighth Corps Area, Fort Sam Houston. A. Bowen.—p. 107.
Emergency Treatment and Primary Apparatus for Fractures of Jaws in Warfare. L. C. Fairbank and R. H. Ivy.—p. 124.
Injuries of Wrist. D. Fisher and J. Segal.—p. 134.
Syphilis, Its Significance, Importance and Control in the Military. E. H. Marsh.—p. 155.
Traumatic Surgery in Its Relation to Military Service. W. W. Lasher.—p. 162.
Vitamins for the Pilot or the Importance to the Pilot of a Balanced Diet. M. M. Kafka.—p. 167.
Psychoses Following Trauma. T. H. Fox.—p. 178.

Eosinophilic Bodies in Influenza.—According to Parsons, in most virus diseases in which he has examined the blood it is possible to demonstrate minute acidophilic (eosinophilic) bodies and he finds influenza to be no exception. Since 1935 he has made it a practice not to make a diagnosis of influenza unless, in addition to the usual clinical and laboratory observations, these minute eosinophilic bodies could be demonstrated both in the erythrocytes and free in the plasma. The bodies can be shown in most cases by using Wright's stain. In a typical case the bodies are found in great numbers in and out of the erythrocytes as refractile, mildly eosinophilic, minute oval, round or slightly elongated objects. From one to several may be seen in a large proportion of the red blood cells, while in the plasma they occur in irregular groups or they may be more or less evenly distributed. They are present from the inception of the disease and are often most abundant on the fourth day. They have been found as late as the ninth day and they are probably present for some days thereafter. Their number seems to coincide roughly with the severity of the disease, being abundant in severe cases. They are not ordinarily found in the leukocytes, but in cases of influenzal empyema they are found in the pus cells and also free in the pleural exudate. The appearance of these bodies is characteristic; they resemble those found in the common cold except that in the latter they are accompanied by darker staining, heavier appearing bodies that are round, or round with part of the circumference thinned out giving them a three fourths moon appearance.

New England Journal of Medicine, Boston

222: 205-246 (Feb. 8) 1940

Further Studies on Treatment of Peptic Ulcer with Aluminum Hydroxide Gel. E. S. Emery Jr. and R. B. Rutherford, Boston.—p. 205.
*Omentumectomy as Safeguard Against Recurrence of Omental Adhesions. C. L. Larkin and Virginia G. Burnham, Waterbury, Conn.—p. 208.
Prognosis of Infantile Tuberculosis. C. A. Smith and W. DeLacey, Boston.—p. 213.
Gangrene of Scrotum and Repair by Simple Plastic Operation: Report of Case. H. H. Howard, Boston.—p. 217.
Urethritis Follicularis. I. J. Zimmerman, Manchester, N. H.—p. 221.
Syphilis. C. G. Lane and G. M. Crawford, Boston.—p. 224.

Omentumectomy as Safeguard Against Adhesions.—Larkin and Burnham point out that omental adhesions cause distressing gastrointestinal symptoms and chronic invalidism and that up to the present time no satisfactory method has been proposed that would prevent this complication. The almost universal practice seems to be to let the omentum alone except where by its adherence it causes definite obstructive symptoms or displacement of the organs. In such cases the omentum is freed at the point where a dysfunction is being caused and is allowed to drop back into the abdomen, no attempt being made to free any more of it that may be adherent elsewhere. Surgeons have realized the seriousness of adhesions following operations and have tried all sorts of means to prevent them. Innumerable solutions, gases, oils, waxes and membranes—such as oxygen, nitrogen, air, salt solution, dextrose, sodium citrate, olive oil, hydrous wool fat, gelatin, paraffin, gum arabic, silver foil, guttapercha, Cargile membranes, amniotic fluid and silk—have been tried, and they have all produced the very thing that they were introduced to prevent. The authors, in performing pelvic operations, free the adherent omentum by cutting the weblike or fibrous connective tissue that attaches it to the peritoneum. Traction is next placed on the freed omentum, and it is pulled through the incision. When it is pulled upward, the transverse colon is visualized and the attachment of the omentum to its superior border is noted. A suture is placed through the border of the omentum at the hepatic flexure, and the omentum is cut through just distal to the tie. The excision is continued along the upper border of the transverse colon to the splenic flexure. As soon as the heavy omental apron is removed, the whole colon has a tendency to be drawn into the upper abdomen above the umbilicus by the shortened greater omentum, which runs from the greater curvature of the stomach to the upper border of the transverse colon. Consequently there is no longer a fat pad covered with serous membrane between the small intestine and the parietal peritoneum. This leaves a thin, raw area, about 0.3 cm. thick, stretching along the whole superior border of the transverse colon. The outer and inner surfaces of this area consist of a thin layer of epithelial cells, and in between are fat tissue and a lacework of connective tissue; there is no injured parietal peritoneal surface in the upper part of the abdomen to which the cut edges of the incisional wound can adhere. The cut edges naturally adhere to each other, being contiguous and raw. The injured parietal peritoneum in the pelvis comes in contact only with the visceral peritoneum, and the viscera, continually changing position, do not stay in one place long enough to adhere. The authors place special emphasis on anesthesia that produces complete abdominal relaxation. The histories of the seventy-six patients from whom in the last seventeen years either all or a large part of the omentum has been removed were reviewed. Except for two cases concerning which information is lacking, none have had to undergo a subsequent laparotomy because of complications arising from the removal of the omentum. Omentumectomy was only one part of the operative procedure, and therefore the good results following these operations cannot be attributed to the removal of the omentum, but at least it has enhanced rather than lessened the patients' chances of good health.

New Jersey Medical Society Journal, Trenton

37: 47-94 (Feb.) 1940

Acute Hematogenous Osteomyelitis: Diagnosis and Treatment. J. E. Toye, Arlington.—p. 51.
Endocrinology in Modern Practice. W. L. Wolf, New York.—p. 53.
Indications for Estrogenic Therapy. T. B. Lee, Camden.—p. 54.
Infantile Paralysis and the Betty Bacharach Home: Preliminary Report. D. B. Allman, Atlantic City.—p. 57.
Adoption Investigation for the Safety of the Child, the Parents and Society. Ellen C. Potter, Trenton.—p. 63.

New Orleans Medical and Surgical Journal

92: 413-488 (Feb.) 1940

Hepatitis: Its Etiology, Diagnosis and Treatment. S. A. Portis, Chicago.—p. 415.
Diagnosis and Treatment of Urinary Infections in Children. J. D. Youman, Shreveport, La.—p. 425.
Effect of Gastric Digestion on Allergic Power of Pollen. Narcisse Thiberge, New Orleans.—p. 430.
Irradiation Therapy in Endocrine Dysfunction. J. N. Ané and L. J. Menville, New Orleans.—p. 433.
*Sulfanilamide and Fever Therapy in Treatment of Venereal Lymphogranuloma. J. A. Trautman and H. A. Thomason, New Orleans.—p. 441.
Artificial Pneumothorax: Treatment of Ambulatory Patients with Pulmonary Tuberculosis. S. Jacobs, New Orleans.—p. 446.
Abdominal Pregnancy: Report of Case. J. M. Bodenheimer, Shreveport, La.—p. 454.

Sulfanilamide and Fever for Venereal Lymphogranuloma.—Trautman and Thomason add twenty cases to the sixteen cases of venereal lymphogranuloma treated with artificial fever or sulfanilamide and reported in 1938. The duration of the glandular involvement before treatment was begun ranged from six days to 139 days, the average being 35.6 days. In thirty-two cases the duration was less than two months and in only four was the duration more than two months. Of the thirty-six patients, four received fever therapy alone, twenty-nine sulfanilamide alone and three a combination of sulfanilamide and fever therapy. Various forms of treatment were given the remaining patient, who was most uncooperative. As a rule, response was prompt with progressive decrease in pain and swelling of the involved glands, and closure of the drain-

ing areas. Thirty-four patients attained apparent recovery in an average of 17.4 days and were discharged as fit for work at the end of that time. One patient was improved but still had slight painless swelling of the inguinal glands after twenty-seven days of treatment. This patient received sulfanilamide for nine days, following which a generalized maculopapular dermatitis developed. The dermatitis disappeared in a few days. Sulfanilamide was begun again sixteen days after the onset of the dermatitis, and after one dose of 20 grains (1.3 Gm.) of sulfanilamide the dermatitis recurred. Fever therapy was then attempted but the patient refused to continue the treatment after being in the cabinet for not more than one hour. Great improvement was obtained, but the final result is not known as the patient has not been seen since discharge. Only three patients were hospitalized for longer than thirty days; the average hospitalization for the thirty-five patients was 17.6 days. For the four patients receiving fever therapy the average hospitalization was 21.2 days, for the two who had fever therapy and sulfanilamide it was 29.5 days and for the twenty-nine patients receiving sulfanilamide alone it was 16.3 days. For the seven patients who received fever therapy an average of five fever sessions was necessary, or twenty-five hours of fever at a level of from 105 to 106 F. Up to the present no recurrences have occurred. Excision of the involved glands was unnecessary in the thirty-six cases.

New York State Journal of Medicine, New York

40: 235-308 (Feb. 15) 1940

Present Trends in Treatment of Pneumonia in Children. W. C. Emm, Syracuse.—p. 241.
Use of Amphetamine (Benzedrine) Sulfate in Alcoholism With and Without Psychosis. E. C. Reifenstein Jr. and E. Davidoff, Syracuse. —p. 247.
Acute Pancreatitis. J. J. Morton Jr., Rochester.—p. 255.
Bowen's Precancerous Dermatosis of Mucous Membrane: Review of Literature and Report of Two Cases. A. C. Cipollaro, New York, and P. D. Foster, Los Angeles.—p. 264.
Value of Stereoscopic Pneumographic Studies in Diagnosis and Localization of Renal and Ureteral Calculi. W. W. Scott and J. A. Benjamin Jr., Rochester.—p. 276.
Mode of Acquisition of Lymphogranuloma Venereum of Anorectal Type. A. W. Grace, New York, and G. W. Henry, White Plains.—p. 285.

Philippine Islands Med. Association Journal, Manila

19: 727-796 (Dec.) 1939

*Observations on Use of Typhoid Convalescent Serum in Treatment of Typhoid Fever. P. T. Lantin, S. Morales and J. Silva, Manila.—p. 727.
Studies on Vitamin C: VI. Blood Ascorbic Acid in Leprosy. Isabelo Concepcion and Solita F. Camara, with assistance of B. Fulgencio, Manila.—p. 733.
Pneumonia Treated with Sulfapyridine: Seven Cases. S. Y. Orosa, Bacolod, Occidental Negros.—p. 741.
Medicinal Use of Tañgan-Tañgan Oil as Substitute for Imported Castor Oil. R. Guevara, Manila.—p. 745.

Convalescent Serum for Typhoid.—Lantin and his co-workers give the results obtained in seventeen cases of toxic types of typhoid treated with convalescent typhoid serum donated by persons recently recovered from the toxic form of the disease. The serum was separated aseptically from the clot and was tested for sterility and Wassermann reaction. The serum not only influenced the recovery and the fatality rates but the course of the disease as well. Generally, after 20 cc. of serum was administered by either the intramuscular (seven patients) or the intravenous (ten patients) route a noticeable improvement in the appearance of the patients was observed shortly after. There was a gradual amelioration of the toxic symptoms, diminution of delirium, improvement in the pulse and lowering of the temperature. Either the temperature came down gradually or it became intermittent or remittent before reaching the normal. The patients who responded favorably usually experienced a growing feeling of general well being. Although improvement of the toxic symptoms occurred in both series of patients in those treated by intramuscular injections the evidence of improvement was, as a rule, delayed by a few days. Intravenous administration of the serum hastened considerably the onset of favorable reaction and the degree of improvement. Two cases in each group terminated fatally. Of seven control patients (not treated with serum) four died. There were no serum reactions, such as are often observed when heterologous immune serum is employed.

Public Health Reports, Washington, D. C.

55: 227-264 (Feb. 9) 1940

Disabling Diseases of Childhood: Their Characteristics and Medical Care as Observed in 500,000 Children in Eighty-Three Cities Canvassed in the National Health Survey, 1935-1936: II. Medical and Nursing Care. Dorothy F. Holland.—p. 227.

55: 265-302 (Feb. 16) 1940

Limitations of Euglenidae as Polluted Water Indicators. J. B. Lackey and R. S. Smith.—p. 268.
Bacterial Assay of Riboflavin in Urine and Tissues of Normal and Depleted Dogs and Rats. H. F. Fraser, N. H. Topping and H. Isbell. —p. 280.

Rhode Island Medical Journal, Providence

23: 17-30 (Feb.) 1940

A State Hospital Physician Looks at Health in Rhode Island. C. P. Fitzpatrick, Howard.—p. 17.
Dental Problems of Interest to the Medical Man. R. L. Webster, Providence.—p. 21.

South Carolina Medical Assn. Journal, Greenville

36: 33-64 (Feb.) 1940

Problems in Minor Traumatic Surgery, with Special Reference to the Hand. S. C. Hays, Clinton.—p. 33.
Sulfapyridine Treatment of Lobar Pneumonia. W. H. Kelley, Charleston. —p. 37.
Epilepsy and Its Management. S. B. McLendon, Columbia.—p. 40.
Cancer of Lung: Successful Pneumonectomies. F. P. Coleman, Columbia.—p. 45.

Southwestern Medicine, El Paso, Texas

24: 1-42 (Jan.) 1940

Bundle Branch Block: Review of Cases. R. H. Homan, El Paso, Texas.—p. 1.
Treatment of Fractures of Neck of Femur by Internal Fixation. W. C. Campbell, Memphis, Tenn.—p. 3.
Electrosurgery and Radiotherapy for Breast Cancer. B. H. Orndoff, Chicago.—p. 7.
Use of Miller-Abbott Tube. H. D. Cogswell and C. A. Thomas, Tucson, Ariz.—p. 10.
Subserous Cholecystectomy with Cystic Duct Drainage and Lipiodol Injection of Common and Hepatic Ducts. J. H. Patterson, Phoenix, Ariz.—p. 14.
Diagnosis and Management of Acute Intestinal Obstruction: Clinical Study of 100 Consecutive Cases. G. A. Stevens, Hollywood, Calif.—p. 17.
*Incidence of Spirochetes and Fusiform Bacilli in Throat and Gum Smears. E. L. Breazeale and R. A. Greene, Tucson, Ariz.—p. 20.

Spirochetes and Fusiform Bacilli in Smears.—Breazeale and Greene determined the incidence of spirochetes and fusiform bacilli in throat and gum smears of school children of different social and economic levels, of enlisted men and of college students. Of the 719 smears examined, 465 (65 per cent) did not contain the organisms while 254 subjects, or 35 per cent of the group, did harbor the organisms. The lowest incidence has occurred in a group of school children from homes of superior social and financial levels and the highest incidence was among a group of Mexican children from homes of low social and economic levels. These organisms were found in 41 per cent of a group of Negro school children and Indian children at a boarding school. Of the young adults 27 per cent of the enlisted men (Arizona National Guard), 25 per cent of the female college students and 36 per cent of the male college students harbored the organisms.

Surgery, St. Louis

7: 167-324 (Feb.) 1940

Surgery of Hip Joint from the Physiologic Aspect. W. C. Campbell, Memphis, Tenn.—p. 167.
Branchial Cysts: Report of Two Cases of Cyst of Cervical Sinus. R. B. Malcolm and R. E. Benson, Chicago.—p. 187.
Results of Repair of Ventral Hernias with Sutures of Fascia Lata: Review of Eighty-Five Hernias. C. H. Smith and J. C. Masson, Rochester, Minn.—p. 204.
Disposition of Sac in Operations for Oblique Inguinal and Femoral Hernias. D. A. Willis, Chicago.—p. 212.
Cause and Cure of Inguinal Hernia. P. W. Harrison, Muscat, Arabia. —p. 217.
Spasm of Last Ileal Loop Simulating Regional Ileitis. D. A. Willis, G. C. Coe and J. Arendt, Chicago.—p. 226.
Acute Solitary Diverticulitis of Cecum: Report of Case. A. J. Grace, London, Ont.—p. 232.
Interlobar Perforated Abscess of Lung (Interlobar Empyema). H. Neuhof, New York, and B. Copleman, Perth Amboy, N. J.—p. 236.
Use of Autogenous Rib Cartilage Grafts to Repair Surface Defects in Dog Joints. F. Young, Rochester, N. Y.—p. 254.
Management of Old Contractures of Hand Resulting from Third Degree Burns. R. Jones Jr., Durham, N. C.—p. 264.
Rupture of Main Bronchus from External Injury. L. H. Clerf, Philadelphia.—p. 276.
Plasma Potassium Following Intestinal Obstruction in Dogs. W. F. Greenwood, R. E. Haist and N. B. Taylor, Toronto.—p. 280.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

52: 1-42 (Jan.) 1940

Alopecia of Peroneal Regions as Constitutional Sign of Neuro-Arthritic Diathesis. L. Tommasi.—p. 1.
X-Ray Quality and Skin Reaction. G. Schwarz.—p. 10.
Notes on Some Ointment Bases. G. Bamber.—p. 21.
Emulsifying Bases. J. Soulsby.—p. 25.

British Medical Journal, London

1: 159-200 (Feb. 3) 1940

Injury to Vertebrae Occurring in Royal Air Force: Review of Cases. P. A. Hall and G. H. Morley.—p. 159.
*Convulsions Occurring Under Vinesthene Anesthesia. C. J. M. Dawkins. —p. 163.
Tuberculous Laryngitis: Analysis of 428 Cases. R. S. Stevenson and F. R. G. Heaf.—p. 164.
Some Operative Factors of Seaside Climate. O. H. Kestner.—p. 169.
*Abacterial Pyuria. T. Moore.—p. 170.

Convulsions Following Vinesthene Anesthesia.—During the last two years Dawkins has observed nine nonfatal cases of convulsions among 2,406 vinesthene administrations. The convulsions came on toward the close of the operation and were similar to those encountered under deep ether anesthesia, with the exception that each case had an evipal induction. The literature on ether convulsions does not reveal a single case occurring after premedication with a barbiturate. The intravenous injection of a barbiturate will immediately abort a case of ether convulsions. Therefore a different factor must be present in vinesthene convulsions, as these come on after a barbiturate as well. The five instances of convulsions in the dental group (children from 3 to 9 years of age) occurred after the anesthetic was concluded. Among these children anesthesia was normal and the child was removed to the recovery room. Following the recovery of consciousness twitching of the facial muscles began and was soon followed by twitching of the muscles of the body. The child became unconscious and cyanosed and ceased breathing. Artificial respiration was employed and preparations were made to give evipal, but respiration ensued spontaneously. The convulsions gradually ceased. The color returned to normal and the child would then sleep for about an hour. If awakened earlier it would get up and run about the room, banging its head on the walls and appearing completely incoordinated. On the employment of restraint the child would go to sleep once more and waken later apparently quite normal. Those who were allowed to sleep following the cessation of convulsions awoke normally in about an hour. This "syndrome" has now been accepted by the nursing staff as a normal complication of vinesthene anesthesia and no undue alarm is felt. The nursing staff prefers vinesthene, despite convulsions, to the far greater dangers of ethyl chloride. Careful inquiry into the history of the children revealed no abnormality; each child was seen a week after the anesthetic and appeared to have suffered no ill effects. The author suggests that anesthesia with vinesthene should not exceed an hour in duration.

Abacterial Pyuria.—Moore states that abacterial pyuria is a definite entity, probably caused by an ultramicroscopic virus. He reviews the literature, etiology, symptomatology, diagnosis and treatment and cites a case in which the intravenous injections of 0.3 Gm. of neoarsphenamine at weekly intervals for four weeks caused the condition to disappear.

Lancet, London

1: 205-254 (Feb. 3) 1940

Influenza Epidemic of January-March, 1939. C. H. Stuart-Harris, W. Smith and C. H. Andrewes.—p. 205.
*Treatment of Lymphadenoma and Certain Malignant Growths with X-Ray Baths. W. M. Levitt.—p. 212.
*Hypertonic Sodium Sulfate Treatment of Infected Wounds. J. C. Lyth. —p. 216.
Syringomyelia Combined with Taboparesis: Report of Case. E. L. Hutton and A. J. Galbraith.—p. 219.
Protein Requirement in Adolescence and in Middle Age. I. Harris, J. T. Ireland and G. V. James.—p. 220.

X-Ray Baths in Lymphadenoma and Malignant Growths.—Levitt describes a method of x-ray bath irradiation and the results obtained by its use in lymphadenoma and in radiosensitive malignant disease. The observations recorded are based on 202 cases treated in the ten year period 1929-1939. The term "regional x-ray bath" is used to imply irradiation of the whole thorax with the axillae and neck, or of the whole abdomen with the groins, or a combination of these. The term "trunk bath" denotes irradiation of the whole trunk from the mandible to the groins—the face, head and limbs being protected. Under "lymphadenoma" are included all the diseases in the reticulosis group except reticulosarcoma and the leukemias. The object was to secure the maximal dose consistent with safety, and all parts of the body not to be irradiated were protected. During the first few years treatment was limited to cases that were regarded as hopeless. Later on the indications for the method were widened. High voltage x-rays were used, 180 kilovolts in the earlier cases and 200 kilovolts in the later ones. The filter was 0.5 mm. of copper with 180 kilovolts, and Thoraeus with 200 kilovolts. The focus-skin distances were long, from 60 to 140 cm. according to the size of the field. The method has so far been found of value only in lymphadenoma and in the more radiosensitive malignant growths, namely testicular growths, adenocarcinoma of the ovary, reticulosarcoma (including lymphosarcoma) and Ewing's sarcoma of bone. The indication for the thoracic bath is intrathoracic disease associated with enlarged axillary and cervical glands, though in some cases in which the intrathoracic disease is widespread the bath may be applied even in the absence of enlarged superficial glands. The indication for the abdominal bath is widespread abdominal disease, with or without involvement of the groin glands. In cases in which involvement of the liver and spleen are the main features, without evidence of disease in the lungs or pelvis, a lower thoracic and upper abdominal bath is given. The levels are from the fourth costal cartilage to the umbilicus. The indication for the trunk bath is widespread disease of known radiosensitive type affecting the chest, abdomen and superficial glandular areas. The general effects are variable, depending on the region treated and on idiosyncrasy. The effect on the blood has to be carefully watched throughout the course, and blood counts are carried out at regular intervals. The lower limits which have been adopted as signals for the interruption of treatment are 1,200 total leukocytes or 200 total mononucleated cells per cubic centimeter. The author says that the results are probably little, if at all, inferior to those of local irradiation of local disease of radiosensitive type. Thus a five year survival of two out of seven patients with primary lymphosarcoma without metastases would be regarded as satisfactory. Most of the deaths in this condition are due to metastases, and the question arises whether some form of bath irradiation should not be used in all cases of local disease of known radiosensitive type in the hope of preventing generalization. In the author's opinion there are already sufficient grounds for carrying out such treatment in a small and carefully controlled series of cases.

Sodium Sulfate Treatment of Infected Wounds.—Lyth stated in 1935 that an antiseptic applied to living tissues already invaded by micro-organisms depends for its efficiency on whether it is hypertonic or not. The salt with which he dealt was sodium sulfate and the method advocated was that of soaks of a saturated or nearly saturated solution applied to the surface of infected wounds. In the four years since that time all infected wounds have been treated, apart from immobilization, in this way only, no bactericidal antiseptic having been used; nor was sulfanilamide given to any of these patients. The total number was 1,096. Except those with malignant ulcers, all the patients recovered. The author stresses the startling rapidity with which septic edema melts away when hypertonic solution of sodium sulfate is applied at the point of entry of the infection. He describes several illustrative cases. Sodium sulfate has proved so superior to other salts that he investigated its osmotic properties and compared them with those of sodium chloride and magnesium sulfate, the other two salts in common use. These experiments seem to bear out and possibly explain the author's clinical experience, namely that for the purpose of hypertonic saline dressings for infected wounds sodium sulfate is much more effective than either magnesium sulfate or sodium chloride. He appeals to surgeons and general practitioners, especially those who may be in charge of many infected injuries in this war, to give the hypertonic method a trial and to use a saturated solution of sodium sulfate.

Bruxelles-Médical, Brussels

20: 396-427 (Jan. 21) 1940

*New Procedure of Repeated Alcoholization of Phrenic Nerve: Alcoholophrenipexy. G. Derscheid and P. Toussaint.—p. 396.
Neck of Uterus. De Snoo.—p. 404.

Repeated Alcoholization of Phrenic Nerve.—According to Derscheid and Toussaint, paralysis of the phrenic nerve may be induced by one of the four different technics: (1) the simple phrenicotomy of Stuerz, (2) the procedure of Goetz, which consists of exerting a mild traction on the peripheral end of the sectioned phrenic nerve in order to reveal accessible anastomoses, which are sectioned for an extent of from 3 to 4 cm., (3) Felix's evulsion of the peripheral end of the nerve "up to the diaphragm" and (4) the alcoholization method of Henschen. The last named is favored at present because it provides the best chance for a rapid regeneration. The authors perform a phrenicectomy in the relatively rare cases in which a complete functional arrest is desirable, such as ulcerative fibrotic tuberculosis, extensive bronchiectasis and large callous cavities of the inferior lobes. Repeated alcoholization by a new technic was the method commonly employed by the authors. A horizontal cutaneous incision 2 cm. in length and a fingerbreadth above the clavicle is carried across the external edge of the sternocleidomastoid. The base of the muscle is exposed and the median cervical aponeurosis underneath the omohyoid is divided, exposing the anterior scalenus with its aponeurosis, permitting of visualization of the phrenic trunk. The anesthetized trunk is carefully isolated and gently delivered by traction. Every anastomosis revealed by this elongation is sectioned. The loop of nerve, from 3 to 4 cm. in length, is then fixed to the sternocleidomastoid. The alcoholization is performed superficially in order to avoid deep impregnation. The authors had occasion for renewed intervention in three cases in which operations were performed according to this method. They stress the following advantages: 1. Its immediate physiologic results are constant, because of the exposure and sectioning of the accessible anastomotic fibers. 2. It prevents alcoholic diffusion into the deeper layers. 3. It permits of neuro-electrical exploration to evaluate the stages of regeneration. 4. It permits the completion or prolongation of a favorable therapeutic influence by means of a renewed intervention. The renewed alcoholization represents a test intervention, obligatory before resorting to thoracoplasty.

Ophthalmologica, Basel

98: 193-256 (Dec.) 1939

Prognosis and Treatment of Retinoblastoma. J. R. Anderson.—p. 193.
Clinical Peculiarities of Case of Marfan's Syndrome. R. de Saint-Martin.—p. 201.
*Sulfanilamide Therapy of Trachoma. Sie-Boen-Lian.—p. 208.

Sulfanilamide Therapy of Trachoma.—According to Sie-Boen-Lian, sulfanilamide has been used in severe cases of trachoma at the eye clinic in Batavia since the second half of 1937. Some of the patients had been treated previously with other methods, without success. The total number of those treated with sulfanilamide now exceeds 100. Untoward secondary effects of sulfanilamide were observed rarely. They were mild and transient. To avoid them, the author tried local treatment with sulfanilamide but found that only the oral administration of the drug produced favorable results. The sulfanilamide proved effective in checking the secretion and the diffuse thickening of the conjunctiva. The papillary thickening was influenced only slightly and the granulations not at all. The corneal complications of trachoma (pannus, keratitis and corneal ulcers) responded best of all. Recurrences of corneal complications of trachoma were rare after treatment with sulfanilamide.

Lattante, Parma

11: 1-30 (Jan.) 1940. Partial Index

*Treatment of Poliomyelitis with Diphtheria Toxoid. G. Raffaelli.—p. 9.

Poliomyelitis.—Raffaelli employed diphtheria toxoid in the treatment of acute anterior poliomyelitis in a group of fifty-two infants and three children. The toxoid was administered by intramuscular injections given at intervals of four days in increasing doses of from 2 to 6 cc. up to a total of from four to six injections. The treatment was instituted within three days from the onset of the disease in the majority of cases and within a week in a few instances. No other medical treatment was given. The toxoid was well tolerated. There was neither extension of paralysis nor a fatality in the group. Physical therapy was begun about one month after the discontinuation of the toxoid therapy if sequels were present. In all cases but seven the course of the disease was favorably influenced. The best results were obtained from early toxoid treatment. Complete recovery without sequels was obtained from toxoid therapy alone in twenty-three cases, and from toxoid therapy plus physical therapy of short duration in fourteen cases. The paralyses are slowly improving in eleven cases under prolonged physical therapy. In seven cases the treatment failed to arrest or to modify the symptoms. The author believes that the treatment with diphtheria toxoid stimulates spontaneous regression of the nervous lesions and regeneration of the nervous tissues.

Archiv für klinische Chirurgie, Berlin

197: 319-510 (Nov. 15) 1939

Portal Vein-Hepatic Circulation, Metabolism and Collapse. G. Zopf.—p. 319.
Experiences with Total Extirpation of Stomach. S. Gotô.—p. 385.
Experimental Formation of Thrombosis by Bacterial Infection and Intravenous Injection of Bacterial Toxin. S. Kaneko.—p. 393.
Pathology and Pathogenesis of So-Called Lunatum Malacia. S. Nagura.—p. 405.
*Clinical Aspects and Therapy of Acute Necrosis of Pancreas. E. Reichl.—p. 428.
Motility of Stomach After Resection. K. Otto.—p. 448.
Problem of Abdominal Suppuration After Incisions in Linea Alba. H. H. Westermann.—p. 477.

Acute Necrosis of Pancreas.—A study of 134 cases of acute pancreatic necrosis revealed that in all except one there were biliary disturbances with indefinite gastric pains or with typical gallstone attacks. Reichl therefore maintains that pancreatic necrosis is a secondary disorder, a sequel of inflammatory disease of the biliary system. He estimates that a primary biliary disorder is the cause of pancreatic necrosis in more than 90 per cent of the cases. This applies to genuine necrosis of the pancreas only and not to cases in which an external cause such as operative trauma or Ascaris is the causative agent. In view of the frequency of biliary disease and its role in the pathogenesis of pancreatic necrosis, it appears that the latter is comparatively rare. At the author's clinic the cases of pancreatic necrosis amounted to only 12 per cent of the total number of biliary disturbances. Thus, although biliary disturbance is a factor, the primary provoking cause is still problematic. The various theories regarding it can be classified into three groups: the canalicular, the circulatory and the functional. Reichl believes that several factors are responsible. Opinions are divided with regard to expectant conservative therapy or surgical intervention. Of eighty-nine patients operated on at the author's clinic forty-one died, whereas of thirty-one on conservative treatment only four died. Ten patients hospitalized while in a grave or moribund state died within a few hours or on the same day. The feasibility of conservative treatment rests on a correct diagnosis, which is arrived at by a thorough clinical examination and by the determination of the fasting blood sugar and the diastase content of the urine. The conservative treatment consists of interdiction of food intake for from three to four days, morphine for pain, antispasmodics, stimulation of the intestinal peristalsis by drugs, and warm moist applications and heat to the abdomen. The heart and circulation are supported by the parenteral administration of isotonic fluids and by strophanthin-dextrose-strychnine therapy. If the patient recovers on the conservative regimen, operative intervention on the biliary tract should be resorted to from four to six weeks later, in order to remove the contributing cause. The operation consists of the removal of the gallbladder and of a supraduodenal choledochotomy if the common duct contains calculi or is dilated or inflamed. The choledochus is carefully explored for stones, the papilla is dilated and the duct is irrigated. In order to relieve the pressure on the biliary tree, a Nélaton catheter is sutured into the duct and is left in place for from ten to fourteen days, after which time it can be removed without injuring the duct or causing a fistula. During the last several years, operations on the pancreas itself in the acute stage have been rejected by the author. Residual abscesses and sequestrums are treated in the customary manner. In this way it has been possible to reduce the mortality to 12.9 per cent.

Münchener medizinische Wochenschrift, Munich

86: 1687-1714 (Dec. 1) 1939. Partial Index

War Epidemics in the Sino-Japanese Conflict. A. Schretzenmayr.—p. 1687.
Action of Daily Dose of Depot Insulin. H. Oeller.—p. 1689.
Blood Sugar Determination and Preparatory Treatment of Blood Specimen. K. Dirr and H. Stingel-Munzert.—p. 1694.
*Lipase Determinations in Serum of Diabetic Patients. F. Göbel.—p. 1698.

Lipase Determinations in Serum of Diabetic Patients.—Göbel determined the lipase content of serum of twenty-one diabetic patients. Determinations were made before and after insulin and dietetic therapy, in a control case before and after dietetic treatment. Measuring of the lipase content was made with a stalagmometer according to Rona-Michaelis. Before treatment, increased lipase was found in the serum along with increased blood and urine sugar values according to the severity of the diabetes. The lipase content decreased following treatment along with the blood and urine sugar values. On the basis of these results the author assumes a disturbance in the fermenting processes of fat metabolism in diabetes mellitus proportional to the rate of sugar secretion and outpouring of lipase into the serum.

87: 29-56 (Jan. 12) 1940

*Progesterone Therapy in Habitual and Threatened Abortion. K. Frohnwieser.—p. 29.
Meningococcus Carriers. K. Luz.—p. 30.
Operative Measures for Protection of Eye in Bell's Paralysis. K. Oberhoff.—p. 33.
Divergent Alkali Tolerance of Ulcerous Patients. F. Klewitz and H.-W. Schmidt.—p. 34.
Place of Anesthesia Therapy in Pathology and Therapeutics. K. R. von Roques.—p. 34.

Progesterone Therapy in Habitual and Threatened Abortion.—Frohnwieser reports the successful management with progesterone of eight cases of pregnancy selected from a larger number in which a history of repeated spontaneous miscarriages existed (one totaling eight within six years). In three of the cases glandular therapy was applied to prevent imminent abortion as evidenced by premature bleeding and abdominal pains. The age of the patients was between 21 and 37. Either normal birth and a normal postpartum history could be reported or a normal pregnancy in the ninth month that made further medication unnecessary. Treatment consisted in the administration of 5 international units of progesterone in the form of a corpus luteum preparation given once or twice a week until the thirtieth week of pregnancy. In the author's experience progesterone therapy was successful only in genuine cases of habitual and threatened abortion and invariably unsuccessful when the clinical picture indicated an incipient or progressive stage of the condition. Patients under observation are counseled to report at once after pregnancy is diagnosed and are treated with semiweekly doses of 5 international units of the corpus luteum preparation. As pregnancy advances, one tablet of the corpus luteum preparation C is given thrice daily in addition to the 5 or 10 international units. Special attention is paid to gestation periods in which abortive crises had been previously observed. In threatened abortion from 5 to 10 international units is given every other day, and one tablet of corpus luteum preparation C is added three times a day. Progesterone therapy is discontinued eight weeks before expected confinement. On no occasion has the author encountered antepartum or postpartum complication to prolonged medication.

Wiener klinische Wochenschrift, Vienna

53: 1-24 (Jan. 5) 1940. Partial Index

Diet and Diseases of Blood. N. von Jagić.—p. 1.
Allergic Diseases of Skin, with Special Consideration of Occupational Dermatoses. K. Schreiner.—p. 3.
*Diluted Hydrochloric Acid in Treatment of Tonsillitis. N. Guntscheff.—p. 11.

Diluted Hydrochloric Acid in Tonsillitis.—By observations on himself extending over a period of eight years, Guntscheff concluded that diluted hydrochloric acid (12.5 per cent) is effective in the treatment of tonsillitis. He employs hydrochloric acid for gargling and drinking as well as for the irrigation of the tonsils. The method applied in twenty-three unselected cases demonstrated its efficiency in the treatment of acute tonsillitis and suggested its further use as a prophylactic measure. The method has been found helpful in diphtheria. The author recommends from eight to twenty drops of diluted hydrochloric acid in 200 cc. of lukewarm water for gargling and from twenty-five to thirty drops in from one half to one glass of water for irrigation. The gargling should be repeated every thirty minutes, for about one minute each time. The drinking (about a teaspoonful) is repeated every thirty minutes. The irrigation of the tonsils is accomplished by immersing a cotton compress (size of a nut) into the glass containing the mixture and then pressing it against the upper pole of the tonsil. The author states that the treatment described effects a rapid cure, that it is harmless and inexpensive, and that it can be employed for patients of all ages.

Nordisk Medicin, Helsingfors

4: 3637-3692 (Dec. 16) 1939. Partial Index

Hospitalstidende

*Treatment of Sequelae of Concussion of Brain and Some Other Cerebral Conditions with Subarachnoid Insufflation of Air (Pneumocephalon Artificiale). K. Roepstorff.—p. 3637.
Determination of Ascorbic Acid in Serum and in Daily Diet in Seventy Nurses Given Stomatologic Examination. M. Ottsen, H. Lieck and O. Brinch.—p. 3650.

Treatment of Cerebral Conditions with Insufflation of Air (Pneumocephalon Artificiale).—Roepstorff says that air insufflation treatment is contraindicated in cases with increased brain pressure and changes in the eyegrounds and especially when tumor in the posterior lobe is suspected. The treatment must not be undertaken without careful neurologic examination, including ophthalmoscopy. The contraindications for ordinary smaller interventions must also be observed. With these precautions the treatment is believed to be without danger. Forty-three cases of concussion of the brain with sequels are described in which subarachnoid insufflation of air was followed by good results in about 70 per cent, temporary improvement in about 19 per cent and no effect in about 12 per cent. Other cases treated by the method are also reported. Of sixteen cases of cryptogenic headache ten were improved, five temporarily improved and one slightly improved. In four cases of otogenic or cerebral, nontraumatic vertigo, the dizziness disappeared without other noticeable improvement in the condition. In four cases of narcolepsy the attacks disappeared for a longer or shorter time, and in three cases of epilepsy there was temporary disappearance of the symptoms, while in one case of traumatic epilepsy there have been no attacks for three years. In a case of status epilepticus the attacks ceased, to return gradually after a couple of weeks.

4: 3787-3932 (Dec. 30) 1939. Partial Index

Hospitalstidende

Sterility in Woman. N. Blixenkrone-Møller.—p. 3797.
*Electrocardiogram During Insulin Shock Treatment. A. Grut and M. Lund.—p. 3805.
Epidemiology of Herpes Zoster. L. C. Stage.—p. 3808.
Investigations on Relation of Serum Calcium in Different Neurologic and Medical Diseases: I. Observations on Serum Calcium under Normal Conditions. O. J. Nielsen.—p. 3811.
Id.: II. Determination of Serum Calcium. W. Hjarde and O. J. Nielsen.—p. 3812.
Effect of Epileptic Attacks Due to Metrazol on Lactic Acid Content of Blood. P. Horstmann.—p. 3815.

Electrocardiogram During Insulin Shock Treatment.—Grut and Lund made electrocardiographic recordings (1) during insulin shock, (2) on simultaneous administration of insulin and dextrose and (3) after interruption of insulin shock with dextrose. They assert that sinus arrhythmia, found only in group 1, is the only electrocardiographic change directly due to the hypoglycemia. A slight, never pathologic, broadening of QRS and QT and a narrowing of PQ appear in groups 1 and 3; possibly the hypoglycemia is a contributing factor in these changes. The T depression, most marked in groups 1 and 2, is regarded as an insulin effect; the tachycardia, which is relatively frequent in group 3, and the U wave, in groups 2 and 3, are seen as secondary effects of the insulin (epinephrine and so on). Registration of heart sounds and electrocardiograms show a shortening of the mechanical systole, as found by Hegglin. Because (1) this shortening continues after the hypoglycemic stage, (2) corresponding changes are seen after epinephrine and (3) hyperadrenalemia is often observed after insulin the authors ascribe the shortening of the mechanical systole to a rise of pressure in the aorta resulting from the production of epinephrine secondary to the insulin effect.